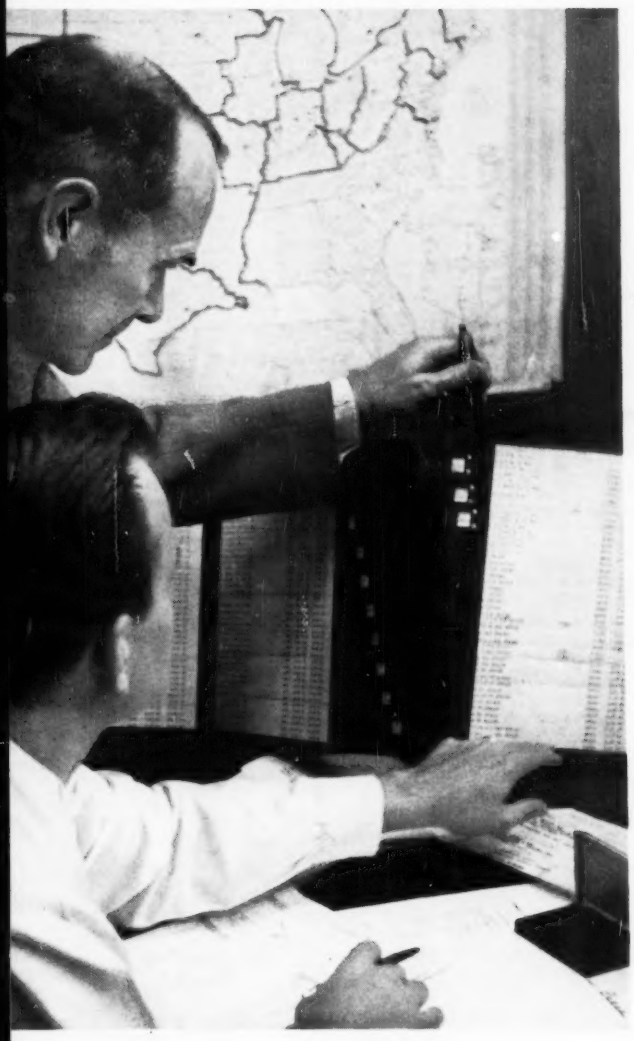
A McGRAW-HILL PUBLICATION

Chemical Week



Kefauver's drug-profits probe —politics, or portent for private enterprise?. . . . . p. 23

Automated order-handling in action . . p. 33

Management's new militancy. How it's paying off in labor bargaining . . . . . p. 43

CW goes to equipment auction. On the block: war-gas plant at Azusa, Calif. . p. 56

Wraps off chemonuclear research. Process of future hits development trail . . . p. 74

December 19, 1959

STEVENS RICE
UNIVERSITY MICROFILMS I
313 N 1ST ST
ANN ARBOR MICH

Picks up where Johnny Appleseed left off

BAREFOOT, he tramped thousands of miles, planting apple seeds wherever he went. Today he would be amazed at the orchards his followers have dotted across the land: *Johnny Appleseed never saw fruit so fine.*

One secret of today's wonder crop is the use of nitrogen-rich fertilizers. In the West, Shell Chemical supplies these plant food combinations keyed to the needs of orchard soils. Bending beneath the weight of hundreds of extra pounds of choice fruit, orchard trees return the grower's expense many times over.

Next time you bite into a juicy, crackling apple, remember that modern Johnny Appleseeds can always count on their partner Shell Chemical—pioneer in ammonia fertilizers.

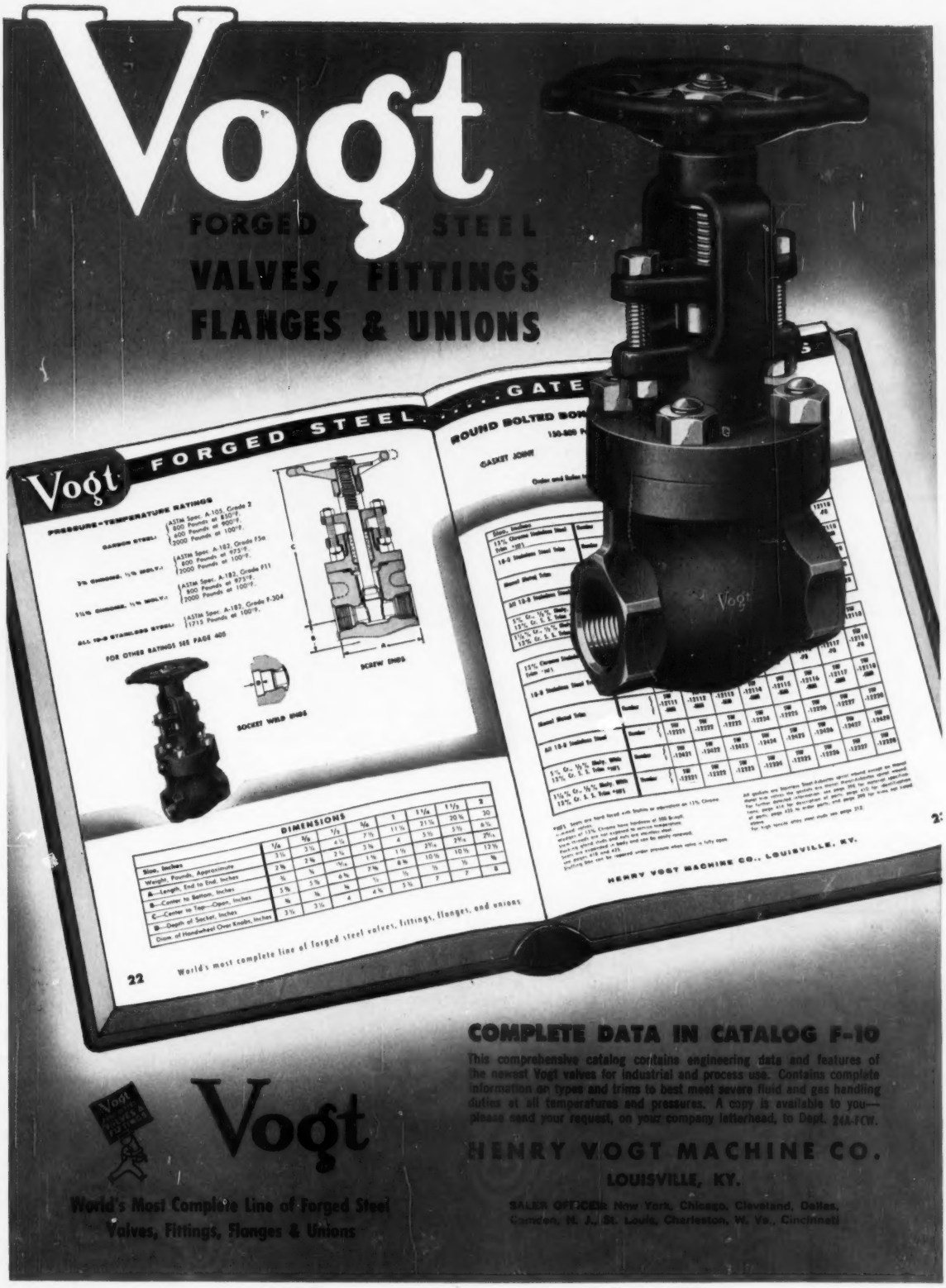
SHELL

Shell Chemical Corporation

Chemical Partner of Industry and Agriculture

SAN FRANCISCO

Things You Should know about


Vogt
FORGED STEEL
VALVES, FITTINGS
FLANGES & UNIONS
Vogt FORGED STEEL
PRESSURE-TEMPERATURE RATINGS
SCREW ENDS
SOCKET WELD ENDS
DIMENSIONS
22
World's most complete line of forged steel valves, fittings, flanges, and unions
HENRY VOGT MACHINE CO., LOUISVILLE, KY.
COMPLETE DATA IN CATALOG F-10
This comprehensive catalog contains engineering data and features of the newest Vogt valves for industrial and process use. Contains complete information on types and trims to best meet severe fluid and gas handling duties at all temperatures and pressures. A copy is available to you—please send your request, on your company letterhead, to Dept. 24A-FCW.
HENRY VOGT MACHINE CO.
LOUISVILLE, KY.
SALES OFFICES: New York, Chicago, Cleveland, Dallas, Camden, N. J., St. Louis, Charleston, W. Va., Cincinnati
Vogt
World's Most Complete Line of Forged Steel Valves, Fittings, Flanges & Unions

among the most useful
inorganic chemicals
made!

WESTVACO® SEAWATER

MAGNESIAS

Whatever your use for magnesium oxide . . . and few inorganics have such broad utility . . . you'll find the grade and form you need always amply available at Westvaco.

We produce the most diversified line of heavy magnesias made, developing new forms as need arises. With 40 years experience behind us, we can frequently modify existing products to meet your special requirements.

When you deal with Westvaco you're sure of a continuing stable supply situation, too. With inexhaustible sources of seawater bittern and convenient dolomite resources nearby, we are prepared to meet all foreseeable demands well into the future.

We'll be glad to send samples and data on the products listed.

WESTVACO® MAGNESIAS Seamag* Neoprene Grade Magnesias Sea Sorb* 43 and 53 Adsorptive Magnesias
#2661, 2663, 2665 Chemical Grade Magnesias #2664, 2667 Oxychloride Magnesias Periclase S-90 Refractory Magnesia

*Trademark

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Westvaco Mineral Products Division
General Sales Offices:
161 E. 42nd STREET, NEW YORK 17

Chemical Week

TOP OF THE WEEK **DECEMBER 19, 1959**

- **What it's like to be a witness** before Kefauver committee. Exclusive interview with Schering's Francis Brown .... p. 22
- **Acrylic emulsion expansion will continue apace in '60:** capacity already towers over current demand .....**p. 37**
- **Plastic laminates for extra-hot uses**—aim of research on resin binders, "web" materials .....**p. 65**
- **Continuing boom in aerosols of all kinds** was predicted at last week's meeting of CSMA .....**p. 70**

10 VIEWPOINT
What price politics? Kefauver hunts headlines in drug-price probe, ignores many significant factors.

10 OPINION

10 MEETINGS

19 BUSINESS NEWSLETTER

22 Is Kefauver's drug industry investigation laying groundwork for restrictive new pricing legislation?

22 If you're called: one embattled witness—Schering's Francis Brown—tells *CW* his experiences.

24 Jersey Standard puts plant management on TV to analyze labor relations, hold off organizing bid by national unions.

25 Seasonal dip doesn't slow CPI capital spending—now at highest level since '57. And outlay is rising.

29 WASHINGTON NEWSLETTER

33 SALES
New order-entry system at Dow speeds customer service, levels production peaks, cuts selling costs.

34 Bargemen foresee rail competition, government regulation as big problems of '60.

34 Government okays use of 1,200-gal. collapsible rubber tanks by non-tank carriers.

37 MARKETS
Big expansion of acrylic emulsion capacity reflects move to put plants near South and Far West markets.

43 ADMINISTRATION
Outcome of steel strike will cue CPI management's approach to upcoming labor bargaining.

51 TECHNOLOGY NEWSLETTER

56 PRODUCTION
West Coast war-gas plant goes on the auction block, provides equipment bargains for chemical plant builders.

61 MARKET NEWSLETTER

65 RESEARCH
Plastic laminates research aims to improve bonding resins, reinforcing "webs." Goal: better temperature-resistance.

68 Armour gives first details of process for extracting metals from sea water.

70 SPECIALTIES
Polish formulation trends, product forecasts highlight Washington CSMA meeting.

72 Lever begins test of new liquid All formulation. Feature: new optical whitener for Dacron.

74 ENGINEERING
Nuclear processing with "fission fragments" and free radicals moves into development stage.

79 Stable detonations, new processing tool, may open door to new chemical operations.

79 1961 cars will have unit to reduce smog-producing engine exhaust.

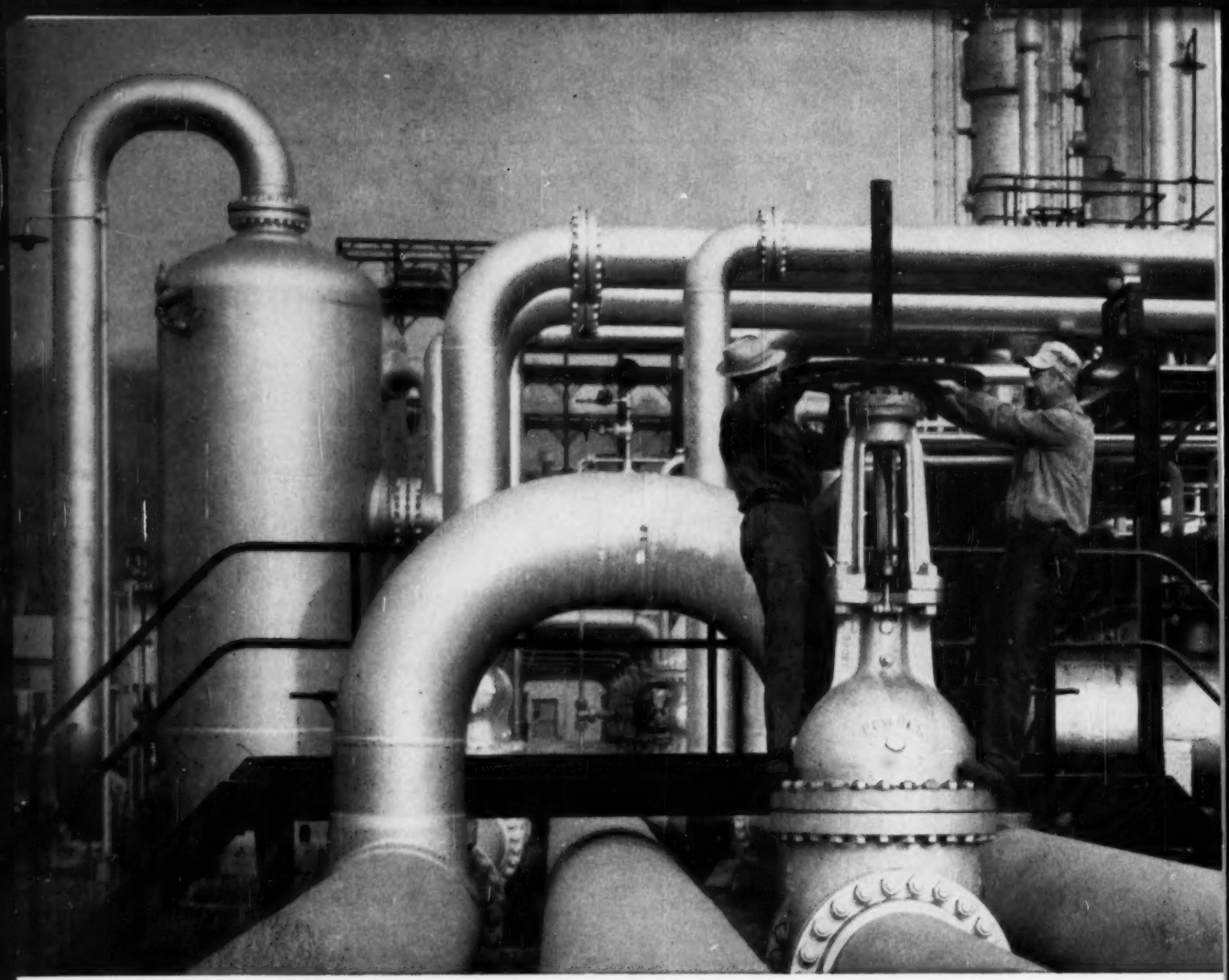
80 BUSINESS BENCHMARKS

44,956 copies of this issue printed

No. 25
Vol. 85

Chemical Week is published weekly and copyrighted © 1959 by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: $3/year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 8 for subscription requirements.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N. Y.

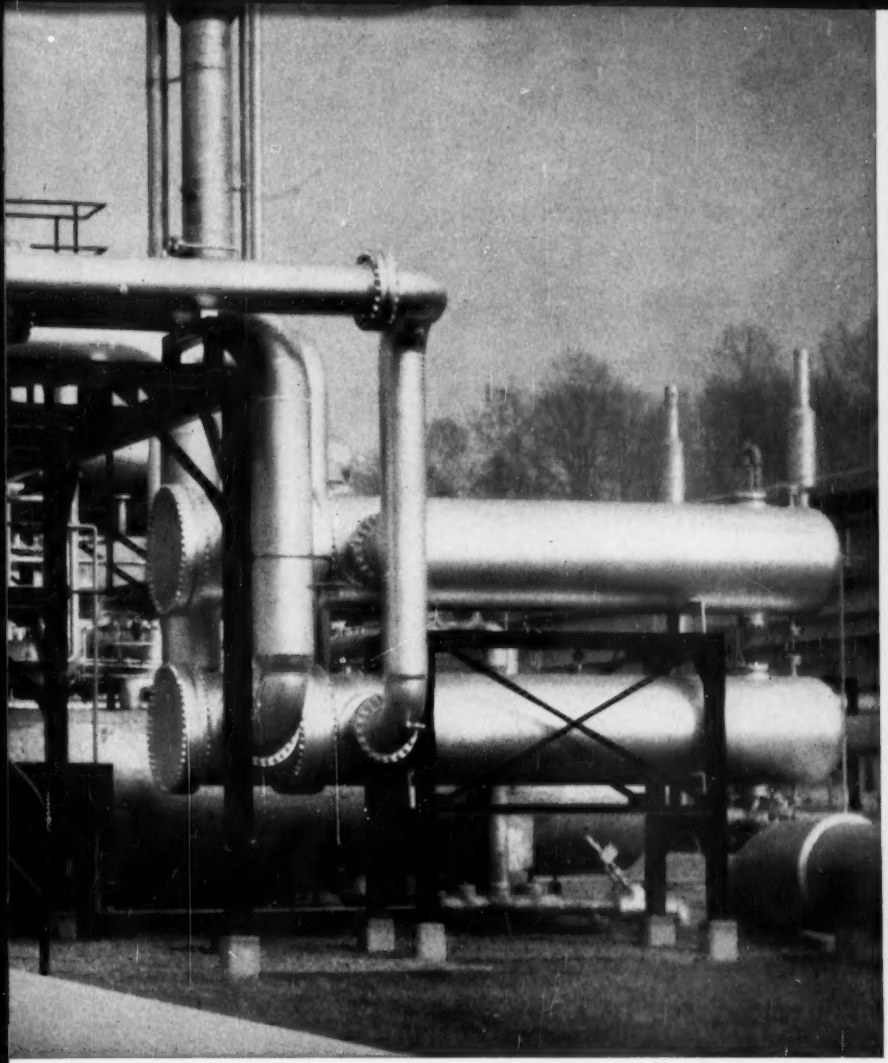


UNION CARBIDE OLEFINS COMPANY

SETS THE PACE FOR TOMORROW'S NEEDS...

This division of Union Carbide Corporation
offers you an economical, dependable
supply of olefins and related products

BUTADIENE · DICYCLOPENTADIENE · ETHANE · ETHYLENE · HYDROGEN · METHANE · PROPANE · PROPYLENE · TOLUENE · UNSATURATE C



UNION CARBIDE OLEFINS COMPANY

Division of
Union Carbide
Corporation

UNION CARBIDE

Because of the dynamic growth of the demand for olefins, Union Carbide has established Union Carbide Olefins Company. It includes the staff and facilities and offers the same high attention to customer service that have been a Union Carbide tradition for 35 years.

The Olefins Company will continue concentrating on research—new, potentially profitable chemicals for your product development . . . on delivery—prompt, reliable bulk shipments from plants strategically located across the country . . . on volume production—assured supply with strict quality control . . . and on customer service—technically trained representatives devoting their time to your problems.

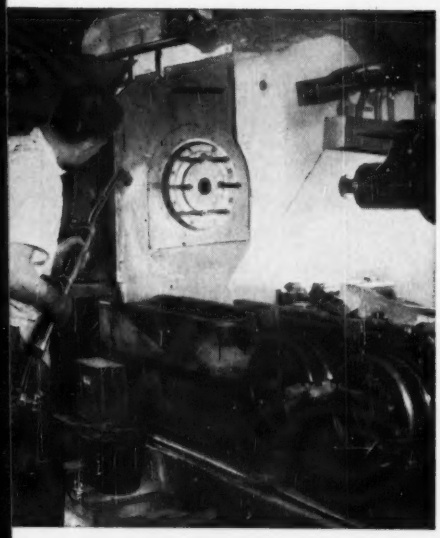
This strong emphasis on olefins will lead to even more useful products from ethylene, propylene, butadiene, and other petrochemical intermediates. Keep in touch with us for more information. Write Union Carbide Olefins Company, Room 630, 30 E. 42nd St., New York 17, N.Y.

• TETRAHYDRONAPHTHALENE • REFINED NAPHTHALENE • CALCIUM CARBIDE • ACETYLENE • QUICKLIME • CALCIUM HYDROXIDE

In toiletries, agricultural chemicals and solvent emulsions,

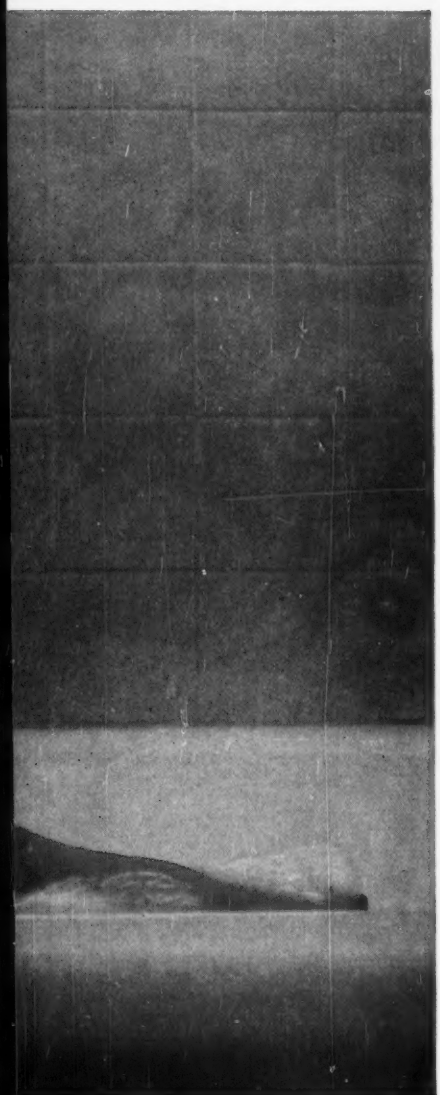
EMCOL EMULSIFIERS TYPIFY... WITCO CHEMICALS AT WORK

ADD THAT SALES ZEST to your specialty formulations with Witco's Emcol 5000 series. These products, available as liquids or powders, build, enhance and stabilize foam. Milady bathes in luxury with the aid of a low cost Emcol product. And, for outstanding all-around performance in liquid detergents as well as cosmetic formulations, Emcol P10-49 is recommended.



METAL PARTS COME CLEANER when you formulate emulsion degreasers with Emcol P10-59. In solvent degreasing, for example, work is dipped into a solution of kerosene and Emcol P10-59, then hosed down with water. Since Emcol P10-59 is both a detergent and emulsifier, parts come oil- and solvent-free. Many other emulsifiers for degreasers are available to meet specific problems.

SPREADING THE PESTICIDE AMONG THE PESTS is another big job done for the farmer by Emcols H-A, H-B and H-C. These Emcols are extremely salt-tolerant ...are the first emulsifiers permitting a wide range of pesticides to be mixed with virtually all types of concentrated liquid fertilizers. Need for two separate sprayings is thus eliminated, saving time and money. **Emcols H-A, H-B and H-C are also valuable for industrial processing applications where the water phase of an oil-in-water emulsion has a high salt content.**



Mail coupon for details of these and other quality Witco Products.

Dept. CW-12

Witco Chemical Company, Inc.

122 East 42nd Street, New York 17, N.Y.

Send me information on the products checked below:

- ☐ Emcol P10-49
- ☐ Emcol P10-59 and H-50A
- ☐ Emcols H-A, H-B and H-C
- ☐ Other Emcol Emulsifiers
- ☐ Resins for Urethane Foams
- ☐ Synthetic Detergents
- ☐ Detergent Additives
- ☐ Spray-Dried Chemicals
- ☐ Organic Chemicals
- ☐ Channel and Furnace Blacks
- ☐ Stearates
- ☐ Stabilizers
- ☐ Driers
- ☐ Plasticizers
- ☐ Rubber Chemicals
- ☐ Gelling Agents
- ☐ Extender Pigments
- ☐ Specially prepared Bituminous Compounds and Mastics
- ☐ Phthalic Anhydride

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

Application:_____

14 Manufacturing Plants · 4 Research and Technical Service Laboratories
Sales Offices in Chicago · Boston · Akron · Atlanta · Houston · Los Angeles
San Francisco · Toronto and Montreal, Canada (P. N. Soden & Co., Ltd.)
London and Manchester, England

versatile

TRI SOD- IUM PHOS- PHATE

CHLORINATED

it does just about everything a detergent compounder's trade asks for in a "3-way cleanser"

As a bactericide and disinfectant, Blockson's TSP Chlorinated is tops. Ditto as a bleaching-sanitizing cleanser. Encore as a deodorizing agent. TSP Chlorinated is a double salt of Trisodium Phosphate and Sodium Hypochlorite. Available chlorine content over 3.25%. Sold under private label or as an adjunct for compounded cleansers. Write for sample, technical bulletin, prices. Stocked by all Blockson jobbers.

OLIN MATHIESON CHEMICAL CORPORATION

BLOCKSON

BLOCKSON CHEMICAL COMPANY

JOLIET, ILLINOIS

Division of Olin Mathieson Chemical Corporation

Chemical Week

Wallace F. Traendly ..... Publisher
Sidney D. Kirkpatrick ..... Editorial Director

Howard C. E. Johnson ..... Editor-in-Chief

Ralph R. Schulz ..... Managing Editor
William Olcott ..... Assistant Managing Editor
J. Robert Warren ..... Assistant Managing Editor
Donald P. Burke ..... Associate Editor
Anthony J. Piombino ..... Associate Editor

DEPARTMENTS

Administration... Cooper R. McCarthy, *editor;* F. Bryan Williams
Business News.. Homer Starr, *editor;* Bruce Bendow; Jane B. Munger
Engineering..... Kenneth C. Wilsey, *editor;* Ryle Miller
Markets..... Jorma Hyypia, *editor;* Philip A. Cavalier
Production..... Herbert C. Short, *editor*
Research..... Joseph F. Kalina, *editor;* Philip A. Untersee
Sales..... Leo J. Northart, *editor;* Carl A. Hiester
Reports..... Vincent L. Marsilia, *editor*
Specialties..... Richard J. Callahan, *editor;* Marion L. Meade
Copy.... William Mullinack, *editor;* Henry S. Gordon, John Philbin
Art..... Robert T. Martinott, *director;* Richard Kluga; Dolores Able
Buyers' Guide..... E. L. Sisley, *editor;* Betsy L. Emery

REGIONAL EDITORS

Chicago: John M. Winton, 520 N. Michigan Ave.
Houston: Thomas H. Arnold, 724 Prudential Building
San Francisco: Emil J. Mikity, 68 Post St.

NATIONAL AND WORLD NEWS

Economics ..... Dexter M. Keezer
Director, News Bureaus ..... John Wilhelm

Atlanta ..... B. F. Barnes
Chicago ..... Stewart Ramsey
Cleveland ..... Arthur Zimmerman
Dallas ..... Marvin Reid
Detroit ..... Donald MacDonald
Los Angeles ..... Kemp Anderson, Jr.
San Francisco ..... Jenness Keene
Seattle ..... Ray Bloomberg
Washington ..... George B. Bryant, Jr.
Correspondents in 75 principal cities.

Beirut ..... O. M. Marashian
Bonn ..... Morrie Helitzer
Caracas ..... John Pearson
London ..... John Shinn
Melbourne ..... Alicja Grobtuch
Mexico City ..... Peter Weaver
Moscow ..... Robert Gibson
Paris ..... Robert E. Farrell
Tokyo ..... Sol Sanders
Correspondents in 78 principal cities.

ABP ABC

Robert S. Muller ..... Advertising Sales Manager

Business Department ..... Alvin J. Babkow, *manager*
Sales Promotion Department ..... Fred E. Lesner, *manager*
Market Service Manager ..... Margaret J. Swikart
Advertising Makeup ..... Robert L. Maier
Advertising Salesmen ..... See Adv. Index, p. 78

Paul W. Erb ..... Circulation Manager
Frances Regan ..... Reprints

DECEMBER 19, 1959 **Vol. 85, No. 25**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE EDITORIAL, CIRCULATION and ADVERTISING OFFICES: McGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, President, Publications Division; Harry L. Waddell, Senior Vice-President; John R. Callaham, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Circulation Coordinator.

Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown in panel below.

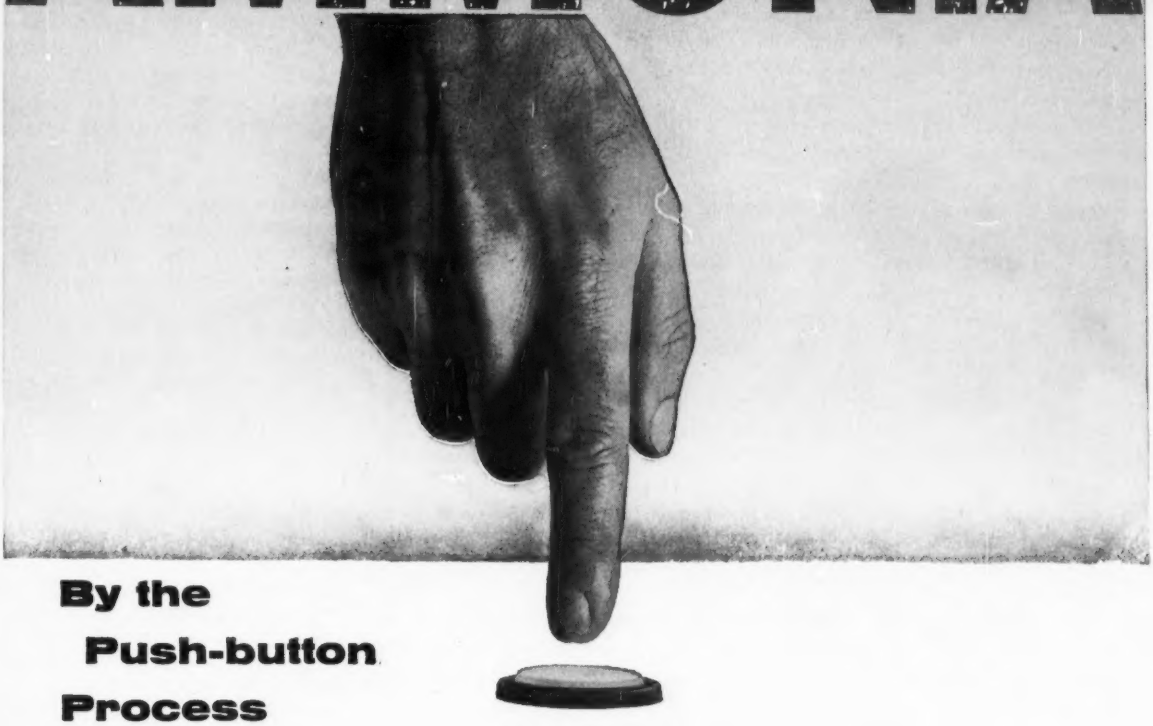
United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office.

© Copyright 1959 by McGraw-Hill Publishing Co., Inc. All rights reserved. **Unconditional Guarantee:** the publisher, upon direct request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week, 330 West 42nd St., New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

AMMONIA



By the Push-button Process

Ammonia plant start-up operations are virtually a matter of "push-button" routine with Chemico; for Chemico has designed and constructed more than 50 ammonia plants in the last 40 years.

While new-comers to the field are constantly running into costly difficulties and delays with unreliable and even untried processes, Chemico designed plants are profitably producing an estimated 25% of the world's synthetic ammonia. Investors in the chemical industries may be interested to learn that despite the proven performance and countless advantages of Chemico's ammonia processes, it frequently costs less to build a Chemico Plant.

Write today for Chemico Bulletin #357 which lists the alternate feed stocks and methods for gas purification and production in the making of ammonia. .

CHEMICO

CHEMICAL CONSTRUCTION CORPORATION
525 West 43rd Street, New York 36, New York

CHICAGO • DALLAS • HOUSTON • PORTLAND, ORE. • TORONTO • LONDON • PARIS • JOHANNESBURG • TOKYO

VIEWPOINT

What Price Politics?

SENATOR KEFAUVER'S HEADLINE HUNT continues. The lights of the TV cameras glare. The witness perspires, hoping he can answer the next committee staff accusation. Members of the audience—mainly from other drug firms and their public relations counsel—breathe sighs of relief that they are not in the witness chair.

It has become quite obvious that the redoubtable senator from Tennessee is not interested in getting all the facts on drug prices.

Look at that allegation of an 1,118% markup on a corticosteroid. The charge made headlines, but it was timed so that the company's answer couldn't appear in the same day's story. The next day, the company pointed out that if you count in the overhead of control testing, research, administration, distribution, royalties and taxes, not to mention a wholesaler's discount, the markup is really 12.3%. Then the committee revealed that it had figured the markup was not 1,118%, but 49%!

If the Senate committee is really looking for facts, we can suggest a few areas that should be covered in the hearings:

(1) Foreign competition. The committee should determine how much—and it is a substantial amount—of the "bread-and-butter" drug sales and profits have been usurped by importers of drugs produced in low-labor-cost countries. Inability of U.S. makers to compete has forced increases in the overhead that must be charged to the newer, patentable items.

(2) Obsolescence. While prepared statements submitted by drug witnesses have mentioned this subject, the committee has shown little interest in learning how fast a drug may move from sales leadership to a has-been.

(3) Retail drug markups. A recent spot-check, by a newspaper, of prescription drug prices in New York City showed some startling contrasts. The identical prescription on a trademarked item that was filled for 98¢ in a discount-house drug department cost $1.75 in an independent neighborhood store, $1.85 in a chain drugstore and $3.95 in a hotel pharmacy. This area warrants further study. In addition, the committee has been stressing certain substantial differences in wholesale drug prices charged by large and smaller drug firms. We are sure that the retail charge for a prescription that does not specify a brand, and thus can be filled with a lower-wholesale-price material, is often filled by the druggist at the same retail price.

(4) Doctors and drug prices. Senator Kefauver should invite testimony from the American Medical Assn.—whose members are, in essence, the public's representatives as far as drug-buying goes. The reasons why a doctor will specify a Merck drug, say, rather than a less-well-known brand, should be studied.

We doubt that the committee will look into these subjects—especially items 3 and 4, which involve politically powerful groups. But we are unhappy that the drug companies—whose political power is far less—are being made the goat of Kefauver's re-election drive.

H. C. Johnson

Editor-in-Chief

OPINION

Federal Statistics

TO THE EDITOR: The recent coverage in CHEMICAL WEEK of the proposed transfer of synthetic organic chemical statistic reports from the Tariff Commission to the Bureau of the Census has been excellent. The feature article "Time for a Change in Federal Statistics" (*CW, Nov. 7, p. 33*) reviewed the subject thoroughly and objectively.

As you may know, the CMRA Statistics Committee is working on a questionnaire to send to our membership to obtain their views on problem areas in government statistics.

Your Viewpoint of Oct. 24 (*p. 101*) and also the Market Newsletter item in the Nov. 21 issue also have helped to bring this problem clearly into focus.

R. S. SCHIEFELBEIN
Chairman
Statistics Committee
Chemical Market Research Assn.
Wilmington, Del

TO THE EDITOR: Many thanks for the mention of the problem of the projected shift of organic chemical statistics from the Tariff Commission to Census Bureau.

We are also working with the Advisory Council on Federal Reports on the problem.

JAMES E. SAYRE
President
Chemical Market Research Assn.
New York

MEETINGS

American Assn. for Advancement of Science, annual meeting, Chicago, Dec. 26-31.

Society of Plastics Engineers, 16th annual technical conference, Conrad Hilton Hotel, Chicago, Jan. 12-15, 1960.

American Rocket Society, solid propellents conference, Princeton University, Princeton, N.J., Jan. 28-29.

Instrument Society of America, instrument and automation conference and exhibit, Sam Houston Coliseum, Houston, Tex., Feb. 1-5.

Society of the Plastics Industry, Reinforced Plastics Division meeting, Edgewater Beach Hotel, Chicago, Feb. 2-4.

American Society for Metals, metals conference, Fairmont Hotel, San Francisco, Feb. 4-6.

ACRYLATE MONOMERS

Looking for something?

Yes. A bump on a base line.
What would that mean?

Presence of contaminating fractions in acrylates.
Found any?

Not in our Celanese acrylate monomers.
So what does it prove?

High purity!
Does that do anything for me?

High purity of our monomers means reduced induction periods. The pure monomer polymerizes at a uniform rate, gives a high conversion of monomer to polymer.
Sounds good!

Products are made better . . . and made easier
Such as?

Emulsions for paints, paper, leather, adhesives, and textiles. Used as chemical intermediates, too.
Mind if I take a peek?

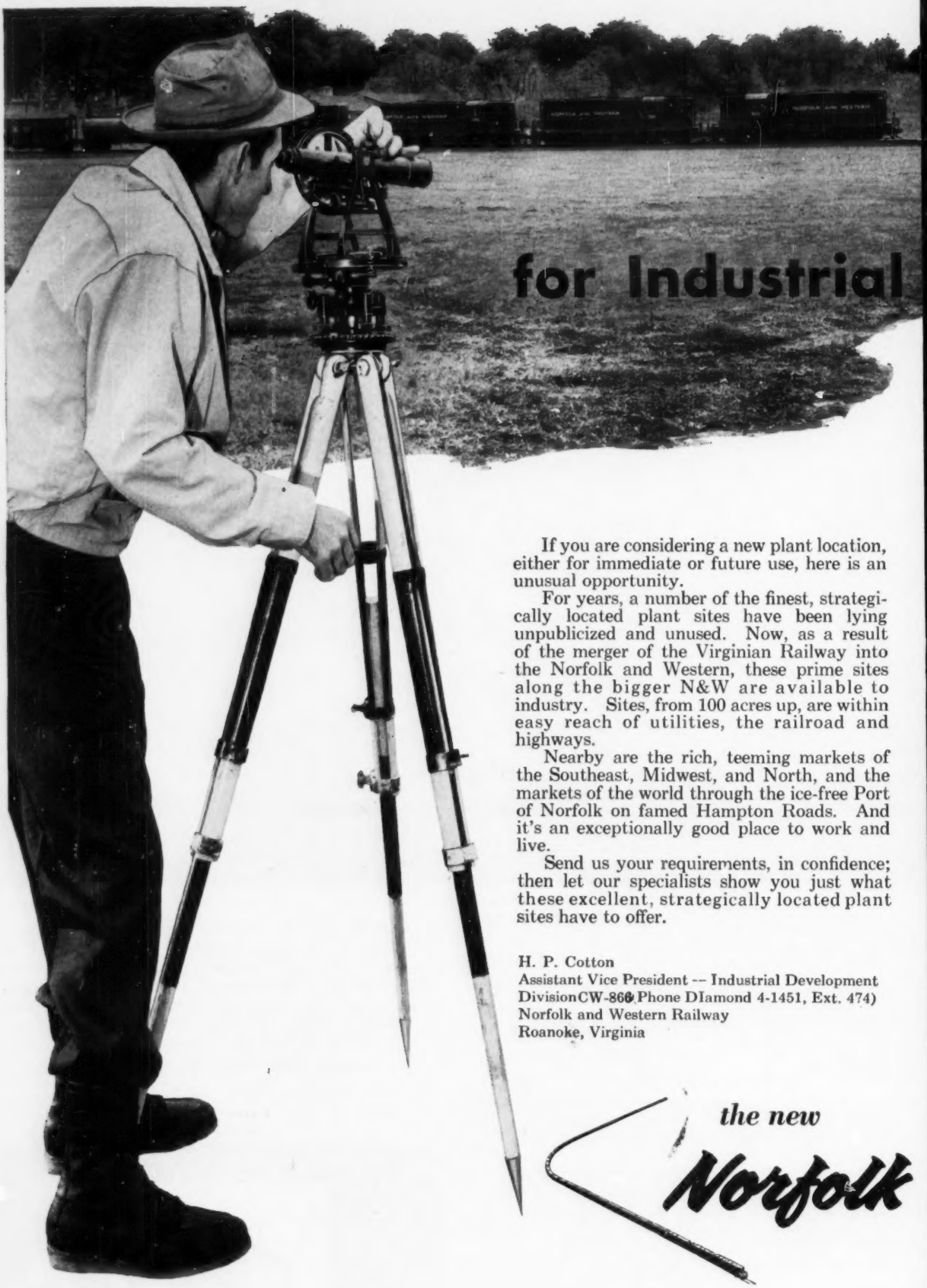
That's what I brought them along for.

We'd do the same for any customer, wouldn't we? And more. We'd even tell the kind of acrylates we make: methyl, ethyl, butyl, and 2-ethylhexyl. The properties, polymerization, inhibition, storage, handling, and shipment of Celanese acrylate monomers is a story in itself. It's all wrapped up in a neat bulletin which is yours for the asking. Write today for "Celanese Acrylate Esters." Celanese Chemical Company, a Division of Celanese Corporation of America, Dept. **652-L** *180 Madison Ave., N.Y. 16, N.Y.*

Celanese®

Canadian Affiliate: Canadian Chemical Company Limited, Montreal, Toronto, Vancouver.
Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16, N.Y.

Celanese
CHEMICALS



for Industrial

If you are considering a new plant location, either for immediate or future use, here is an unusual opportunity.

For years, a number of the finest, strategically located plant sites have been lying unpublicized and unused. Now, as a result of the merger of the Virginian Railway into the Norfolk and Western, these prime sites along the bigger N&W are available to industry. Sites, from 100 acres up, are within easy reach of utilities, the railroad and highways.

Nearby are the rich, teeming markets of the Southeast, Midwest, and North, and the markets of the world through the ice-free Port of Norfolk on famed Hampton Roads. And it's an exceptionally good place to work and live.

Send us your requirements, in confidence; then let our specialists show you just what these excellent, strategically located plant sites have to offer.

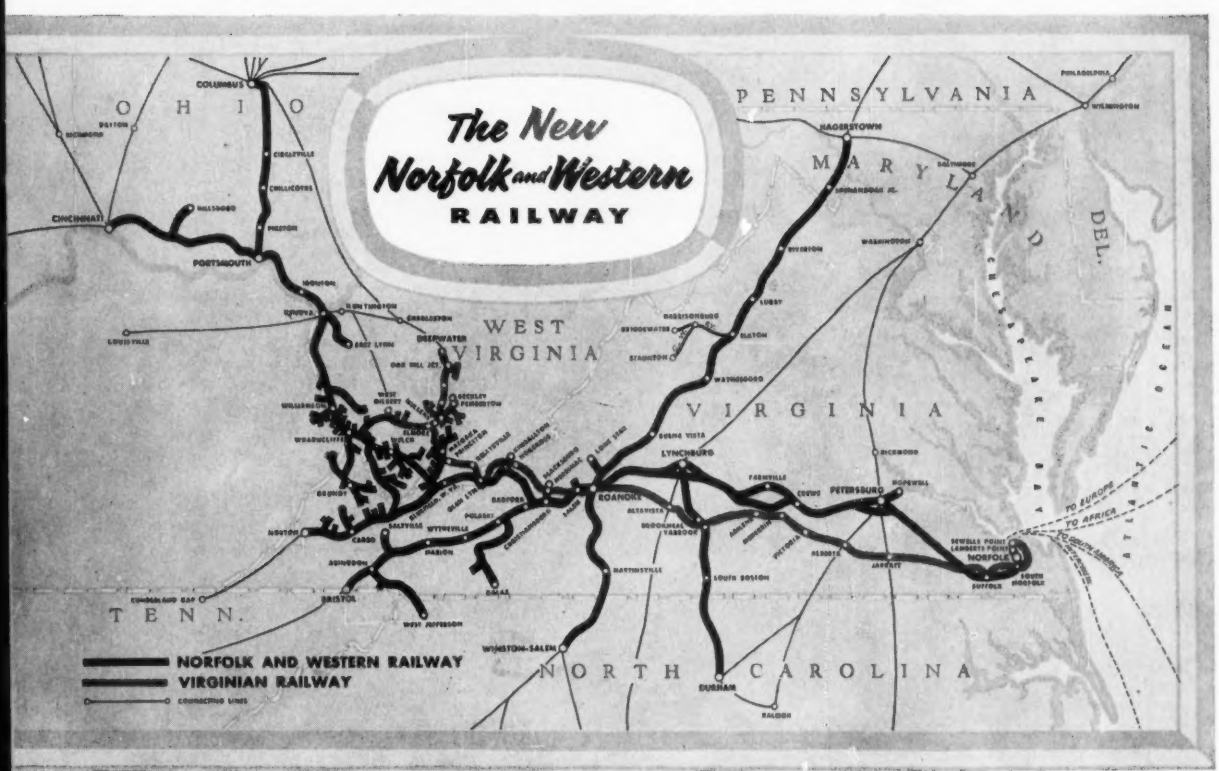
H. P. Cotton
Assistant Vice President — Industrial Development
Division CW-868 Phone DIamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

the new

Norfolk

New Opportunities . . .

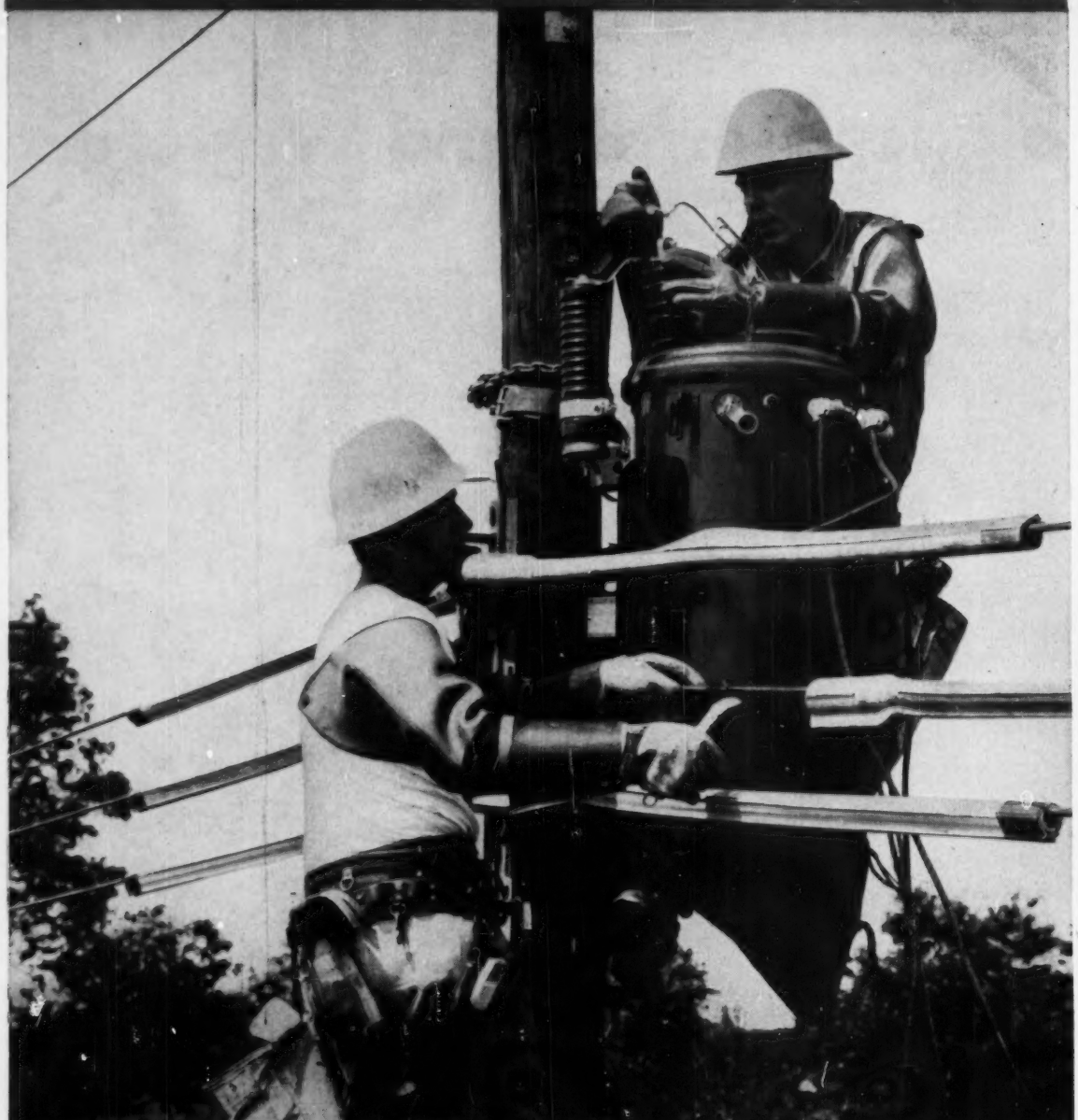
Site Seekers along the new, bigger Norfolk and Western



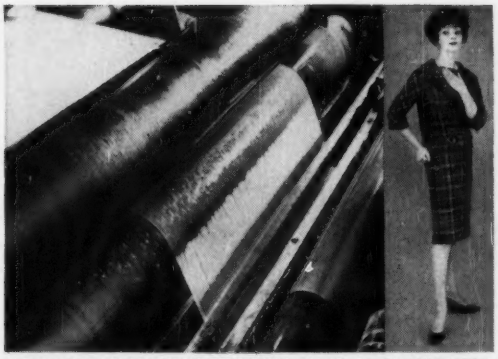
and Western Railway

CYANAMID

Chemical Newsfront

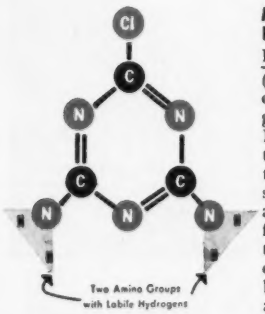


NEW PAPER INSULATION UPS TRANSFORMER PEAK LOAD CAPABILITY 20%. Cyanamid's ACRYLONITRILE has helped General Electric Company develop a new paper for the insulation system of its pole-type distribution transformers. Paper manufacturer Hollingsworth & Vose produces the new insulating paper for GE from kraft pulp chemically treated with acrylonitrile. In a process known as cyanoethylation, acrylonitrile is added to the pulp to modify its chemical structure and greatly strengthen heat-resistance and retention of dielectric and tensile strength properties. Pulp treated with acrylonitrile also results in substantially improved dimensional stability—important for applications such as map paper and business machine punch cards. (Petrochemicals Department)



FABRICS GET DOUBLE PROTECTION IN A SINGLE STEP. Cyanamid has developed a winning combination of two finishes for cotton knit fabrics—CYANA® SHRINKAGE CONTROL AND WASH 'N' WEAR and CYANA® PURIFYING FINISH. Cyana Shrinkage Control enables textiles to resist shrinking, stretching, sagging, spotting, staining and wrinkling. Cyana Purifying Finish reduces odor-forming bacterial activity on the fabric. The only durable finish of its kind, Cyana Purifying Finish is effective on fabrics up to fifty launderings. Now, for the first time, the two finishes can be applied in a *single* economical pad bath operation.

(Textile Chemicals Department)



MOLECULE HAS DUAL FUNCTION. Cyanamid's Diamino Chloro Triazine (DACT) is a product that offers two types of reactive groups in a single molecule. Now you can dust off ideas that have been waiting on the ready availability of just such a structure. For example—you can methylolate for water solubility, react the chlorine under alkaline conditions, and then cross-link through the methylolamine groups. Want to try?

(Market Development Department)

GREATER SAFETY AND ECONOMY IN COAL MINING are advantages of multiple firing of explosive charges with Cyanamid COAL KING* delay electric blasting caps. In multiple blasting, the COAL KING caps detonate *complete rounds* of permissible explosives without requiring the shotfirer to return to the face between blasts, as is necessary for single-hold blasting—this results in reduced exposure of the shotfirer to dust, fumes and hazards of roof falls. The short-delay caps improve loadability over that previously obtainable in multiple blastings with instantaneous caps. Cyanamid's new cap is available in a choice of 15 different timing periods ranging in 25-millisecond increments from 25 to 375 milliseconds.

*Trademark

(Explosives & Mining Chemicals Dept.)

CYANAMID

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

NEWS AT A GLANCE

New vehicle for baking enamels is Cyanamid's Melaqua* 600. A melamine-acrylic resin, it produces ready-to-spray enamel with only the addition of pigment and water—eliminates fire and health hazards by excluding the use of solvents and dryers. Suggested uses: industrial and automotive finishes... A new broad-spectrum antibiotic is being marketed by Cyanamid's Lederle Division. Trademarked Declomycin® demethylchlortetracycline, it is two to four times as active as tetracycline ...Twenty-six American surgeons have been honored by Cyanamid's Surgical Products Division for participating in the annual Cine Clinic program of the American College of Surgeons. Under the Cyanamid-sponsored program, sound and color movies of surgical procedures are made for use in medical teaching programs...Cyanamid's Malathion insecticide has been accepted by the USDA for the control of horn flies on dairy cattle. It is the first phosphate insecticide to be cleared for such use...Cyrea®, Cyanamid's new feed-grade urea is now available. Produced at the Hamilton, Ontario plant, Cyrea is a microprilled product with non-caking and non-bridging properties...The University of Florida is investigating the growth properties of new chemicals alone and in combination with the antibiotic, Aureomycin® chlortetracycline. The work is being done under a Cyanamid grant-in-aid.

*Trademark

For further information on products in this advertisement wire, 'phone—or mail this coupon to:

AMERICAN CYANAMID COMPANY
30 Rockefeller Plaza, New York 20, N. Y.

Please send me additional information on

- ☐ MELAQUA® 600
- ☐ CYANA® SHRINKAGE CONTROL
- ☐ CYANA® PURIFYING FINISH
- ☐ DACT
- ☐ ACRYLONITRILE®
- ☐ DECLOMYCIN®
- ☐ MALATHION®
- ☐ CYREA®
- ☐ COAL KING CAPS

Name_____

Company_____

Position or Title_____

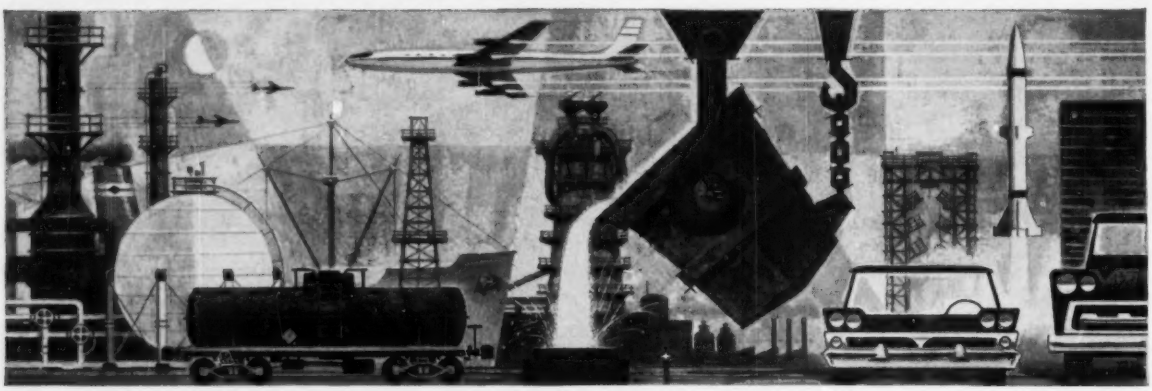
Address_____

City_____ Zone_____ State_____

The Nation's Top

100

Industrial Corporations All Use Harshaw Chemicals



Harshaw Serves 50 Different Industries!

For each of 50 different industries, including the Nation's top 100 industrial corporations, Harshaw produces a variety of important chemicals. For instance, the Petroleum Industry regularly purchases catalysts, metallic soaps, salts and crystals. The Automobile Industry buys electroplating chemicals and anodes, catalysts, fluorides, pigments and metallic soaps. The Chemical Industry uses products from six of our ten industrial divisions.

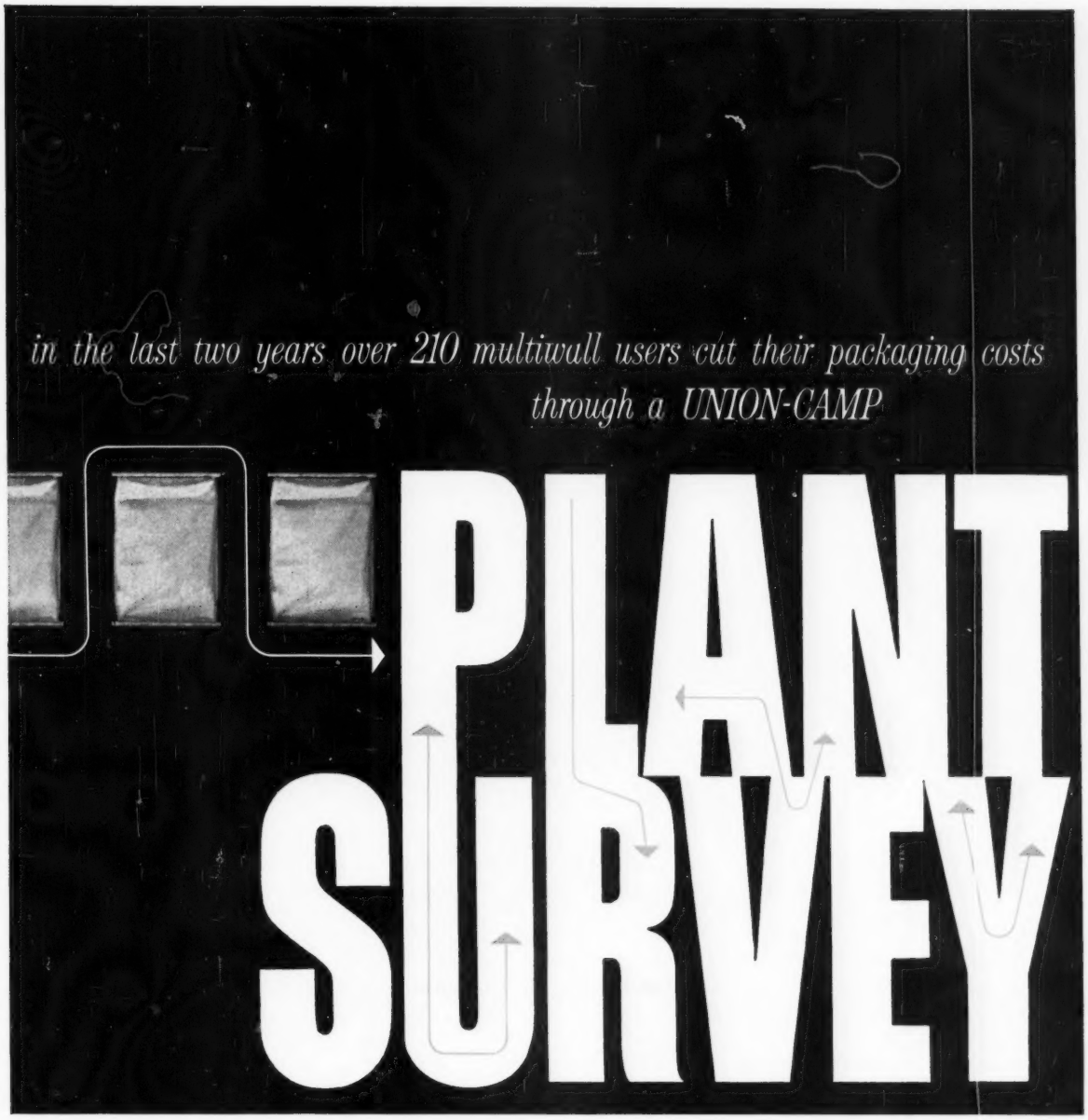
Harshaw produces over 1000 different chemicals for more than 15,000 customers throughout the World. *Probably we have a chemical you can use.* If you have something specific in mind ask us. At your request we'll forward a catalog listing our major products and describing our company.

The Harshaw Chemical Company

1945 East 97th Street · Cleveland 6, Ohio

CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES
HASTINGS-ON-HUDSON • PHILADELPHIA • PITTSBURGH

in the last two years over 210 multiwall users cut their packaging costs through a UNION-CAMP



another FREE service of the 5 Star Packaging Efficiency Plan!

UNION-CAMP's 5-Star Plan has helped over 210 firms reduce their materials handling costs within the last two years alone. The economies resulted directly from a single service feature of the plan . . . a plant survey.

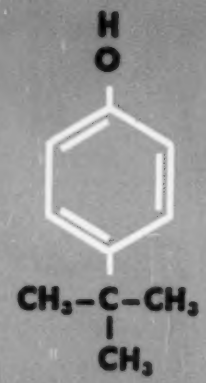
One survey, made for a midwest packer, speeded his multiwall handling operation by 50 per cent. Another company, by following UNION-CAMP recommendations, released labor for more productive functions and saved $37,584. A third multiwall user lowered his costs by nearly $50,000 a year. And there are many more such success stories.

A UNION-CAMP multiwall specialist will be glad to review your present operation . . . show you how the 5-Star Plan can help produce more economical, more efficient control. The plan also covers bag design, bag construction, specifications control and packaging machinery. It's yours without cost or obligation.

Why not start cashing in on it today?

UNION-CAMP
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7, N.Y.

☆ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY



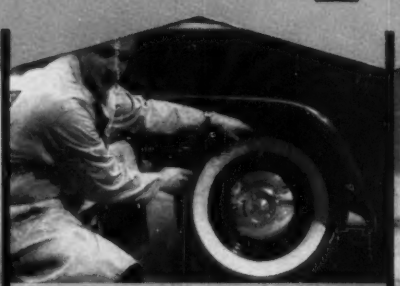
Now In commercial production at Stepan's new Millsdale, Illinois plant (near Joliet) is p-tert-Butylphenol. This new Stepan product . . . one of a series of Stepan substituted phenols . . . can be supplied flaked or as a concentrated solution in caustic. Bulk shipments of the molten Butylphenol can also be made where required. There are a number of interesting commercial and potential uses for p-tert-Butylphenol, and we would be pleased to send you working samples for your evaluation.

Now... a centrally located volume source of

p-tert-Butylphenol

VARNISHES

p-tert-Butylphenol-formaldehyde resins impart rapid drying properties to varnishes, along with improved hardness and durability.



RUBBER

Imparts anti-cracking properties to rubber tires. Useful as an intermediate for curing agents in butyl rubber.

ANTIOXIDANTS

Like most phenolics, p-tert-Butylphenol possesses antioxidant activity that makes it valuable in preserving soap and other sensitive products.

send coupon for samples • bulletin • prices

CW-12C

STEPAN CHEMICAL COMPANY
427 W. Randolph Street
Chicago 6, Illinois

Gentlemen:

Please send me bulletin on p-tert-Butylphenol and working sample.

Name_____

Firm_____

Address_____

City_____ **Zone**_____ **State**_____

STEPAN
CHEMICAL COMPANY
NINOL

427 West Randolph Street, Chicago 6, Illinois
Telephone: STate 2-4711

AMERICA'S MOST COMPLETE LINE OF SURFACTANTS

Business
Newsletter

CHEMICAL WEEK
December 19, 1959

Polypropylene will hurtle into the top rank of plastics by '61, judging from expansion plans taking shape this week.

Texas Eastman has firmed up its polypropylene project at Longview, Tex.—a 20-million-lbs./year plant, to be completed by mid-'61—which will bring this country's total capacity to at least 170 million lbs. by next December and an expansive 430 million lbs. by Dec. '61. Current capacity of the country's polypropylene producers is 50-60 million lbs.; last year, it was 20 million lbs.

Included in that 1961 figure: AviSun, which appears about ready to announce a big new plant, 150-million-lbs./year total; Hercules Powder, at least 130 million lbs.; Humble Oil & Refining, a possible 65 million lbs.; Dow Chemical, about 40 million lbs.; Novamont (affiliate of Montecatini), 25 million lbs.; and Eastman, 20 million lbs./year. And there are at least 12 other likely producers (*CW Propylene Report, Nov. 14, p. 65*).

Texas Eastman says it will be using its own process and producing its own high-purity propylene (from natural gas). Construction of its new plant will begin early in '60, and output is slated to begin within a year. Production at the 20-million-lbs./year rate is expected by summer of '61.

•

Polyvinyl chloride capacity will be expanded 30% at U.S. Rubber's Naugatuck Chemical Division plant at Painesville, O. The company disclosed plans for the expansion at an "open house" for community leaders this week that marked the 10th anniversary of acquisition of the former Glenn L. Martin Chemical Division facilities.

The increased capacity—achieved chiefly via modification and addition to existing equipment for production of plastisol-grade resins—will boost PVC potential to about 65 million lbs./year by July '60. Vinyl chloride monomer capacity at Painesville will be an estimated 70 million lbs./year.

•

Other major expansion moves this week:

• Mobay Chemical and Carwin Co. are plunging ahead in isocyanates. Mobay—while still in the process of increasing capacity of its tolylene diisocyanate (TDI) plant at New Martinsville, W. V., from 12 million to 18 million lbs./year—has decided to start work immediately on further boosting capacity to 25 million lbs./year. And Carwin will go ahead with its proposed new plant near Houston, Tex., to make special isocyanates for use in high-temperature foamed plastics. Initial capacity will be 500,000 lbs./year, but this can be doubled by "minor additions." These two projects will bring total U.S. isocyanate capacity to at least 59 million lbs./year (*CW, Nov. 28, p. 54*).

• Phillips Chemical is going fully commercial on its Cis-4 polybutadiene rubber. Up to now, only developmental quantities of Cis-4 were available. Last month, Phillips revealed plans to boost output to 200,000 lbs./month (*CW, Dec. 5, p. 22*). Now the company says production at Borger, Tex., is to rise nearly 19-fold, to 20,000 long tons/year. Asserting that this synthetic rubber has outperformed natural rubber in both truck and passenger car tire tests over millions of miles during the past three years, Phillips says its expansion is based on a conviction that "several" tire companies will take the initial output. Phillips will be producing its own monomer at the same site.

• Heyden Newport Chemical will double its capacity at Fords, N.J., for ortho- and para-toluenes. The expansion—to be completed within a year—is "in anticipation of greater captive use, as well as heightened industrial requirements." A new, Heyden-developed process will be used to produce such derivatives as *p*-chlorobenzyl chloride, *o*-chlorobenzaldehyde, and *o*- and *p*-chloro benzoic acids.

•

Hercules Powder Co. is revamping its international operations along the lines followed by several other major U.S. chemical companies. It has drawn all export and overseas manufacturing operations into a new International Dept., which will have equal status with its six industrial departments. Right now, Hercules has two producing subsidiaries in England and one in Mexico.

Hercules' next overseas venture may be in Egypt. It's negotiating with Misr Co. to set up a jointly owned toxaphene plant. The material is in demand for fighting cotton boll weevils.

•

American Cyanamid will dive into Britain's synthetic fiber market. Its U.K. subsidiary, Cyanamid of Great Britain Ltd., will soon start marketing Cyanamid's Creslan acrylic. Initially, the fiber will come from the U.S., but British observers believe that if it catches on, Creslan will eventually be produced in the U.K. Cyanamid will be bucking a continually tightening market. In the past few weeks, both Courtaulds and Chemstrand Ltd. cut prices on their acrylic fibers.

Meanwhile, Courtaulds continues diversifying. Its latest move is a royalty arrangement with Glidden International, subsidiary of the Glidden Co. (Cleveland), for exclusive rights to Glidden's development and manufacturing technology and formulations in Britain. Courtaulds acquired a paint company, Cellon Ltd., for $1.8 million last August.

•

Businessmen in Cuba are worried about possible expropriation. Many of them (including managers of U.S.-owned operations) have been receiving government "requests" to train army officers "so they will be able to direct any business enterprise."

You helped Jefferson grow like sixty in fifty-nine

In a capsule, your tremendous acceptance of Jefferson chemicals and services has enabled us to triple our stake in the petrochemical industry. A glance back at fifty-nine will help you anticipate bigger and better Jefferson developments in the future:

January . . . New direct oxidation plant on stream with 50% increase in ethylene oxide production.

February . . . New facilities triple ethylene production, double ethylene glycol.

March . . . New chlor-alkali plant adds 60,000 tons/year of caustic soda capacity.

April . . . Improved specifications on nonyl phenol announced.

May . . . Increased production of specialty chemicals.

June . . . Launched production of propylene oxide and derivatives.

July . . . Tightest ethylene oxide specifications in the industry announced.

September . . . Jefferson pioneers special movement of chemicals by high-speed integrated tow.

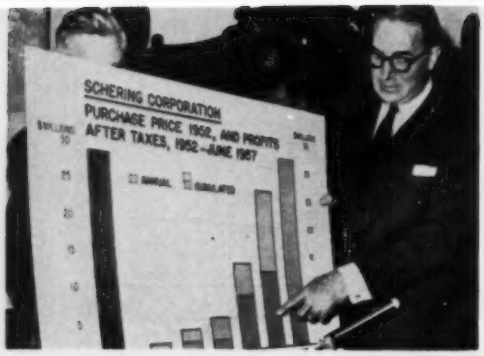
December . . . Jefferson announces new superior, corrosion-inhibiting antifreeze formula, JC-20, for the Private Label market.

These production increases occurred at Jefferson's 1100-acre plant site on the deep channel Neches River near Port Neches, Texas. Equally active were the men engaged in exploratory and application research at Jefferson's extensive laboratories in Austin, Texas . . . and the nationwide group of marketing and technical service men who help make your uses of Jefferson chemicals more profitable.

Look for more significant Jefferson developments soon . . . for the best in chemical services right now, contact Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

HOUSTON • NEW YORK • CHICAGO • CLEVELAND • CHARLOTTE • LOS ANGELES

JEFFERSON CHEMICALS



UPI

Sample of statistical material used against drugmakers is displayed by Senator Kefauver.

End of Round

The pharmaceutical industry is bloody but unbowed. It defended itself with hard-hitting arguments at Senator Estes Kefauver's antitrust subcommittee probe into drug-pricing, which recessed last Saturday after a week of hot charges and countercharges. But the battle will resume again in January.

In the Senate's klieg-lighted marble caucus room, industry leaders spoke up with these arguments:

- Drug firms spend more of each sales dollar on research than firms in any other industry—7¢, compared with the all-industry average of 2¢. Furthermore, the price of a successful drug has to cover the costs of all the research and development that leads to nothing.
- Unlike products of other industries, a drug company's top-seller can become obsolete overnight.
- Big drug firms can sell products at higher prices than their small competitors because physicians have confidence in the brand name.
- The drug industry is highly competitive. Some 16 companies account for two-thirds of the business, while six companies in steel and two in autos take the same share of their respective markets.

Strong Attack: The subcommittee had a big bagful of tough arguments ready to hurl at the drug company

Harried executive faces a hostile committee

Francis C. Brown (*below right*), president of Schering Corp., sat over coffee in a room in Washington's Statler Hotel last Wednesday morning and conducted a postmortem of his two-day appearance before Senator Kefauver's antitrust subcommittee, inquiring into drug prices (*see above*). With him was Schering general counsel, Irving Jurow (*below, left*).

Brown looked composed, dressed in a soft blue suit, matched by a subdued white-dotted blue tie.

But Brown was angry.

"The advice I received was to come down here to cooperate in a true investigation," he said. "It was an inquisition, and I am indignant. The company became a victim of abuse of power, and a misinterpretation of facts."

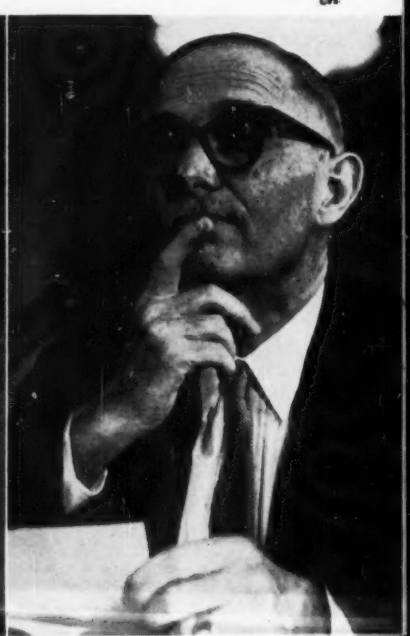
Brown complained that the hearing, as it is being conducted, makes the innocent prove himself innocent. "Kefauver asserts and gets a headline that Schering is guilty of violating the law, without benefit of indictment, cross-examination or judicial verdict."

The chain of events leading to this pass began in March, when the antitrust subcommittee wrote to Brown, informing him that a subpoena was being served by separate letter. The subpoena directed the company to supply documents and records by June. But the committee did not indicate when hearings would be held.

Brown received another subpoena in September seeking records of company transactions from Jan. '55 to Aug. '59. And the U.S. Patent Office wrote Brown to ask his authorization to let Kefauver staffers read confidential files supplied in support of patent applications and contests.

Brown balked, "There would no longer be any integrity left once a Congressional committee can go into the Patent Office on a hunt." But after learning some other

WIDE WORLD UPI



Chemical Week
December 19, 1959

One in Drug Donnybrook

officers. Backing up the probers was the fact that drugs—with a "captive market" of the sick and aged who must buy the brand the doctor prescribes—make the highest profits of any U.S. industry: in '57, 22% on net worth after taxes. The runner-up, industrial chemicals, made 16%. (But these figures compare the top four drug companies with the top four plus 21 other chemical firms.)

Fortified with a deluge of mail from "the old folks," the subcommittee led off with data on corticosteroid hormones, the new arthritis drugs that may cost a patient $40-50/month for indefinite periods.

Asserted Kefauver and his staff: Schering buys prednisolone in bulk from Upjohn and bottles it for a total cost of 1.6¢/pill, sells it to druggists for 17.9¢/pill with a suggested retail list price of 29.8¢.

Schering President Francis Brown, who took a hard buffeting during the first two days of the hearings (*see below*), replied by citing high research and "service" costs, and pointed to the medical profession's "ready acceptance" of the Schering product.

Merck makes the same drug and sells it to the druggist for 17¢/pill, even though it could buy the same compound from smaller producers and bottle it for a total cost of only 1.3¢/pill. The committee figures this

companies were going to authorize the inquiry, Brown permitted Jurow to instruct that copies of the confidential information be turned over to the subcommittee.

In October, Kefauver announced that the first hearings would be devoted to the price of the steroids, with Merck, Schering and Upjohn called to testify beginning Nov. 30. The date later was set ahead to Dec. 7.

Brown met with every vice-president, every department head three or four times during the next month. A committee from his law, market research and public relations staffs was established to see that information came in from all divisions. Market research was given final responsibility for delivering raw material to Brown for use in preparing a statement. In addition, Brown sought outside advice, from Harvard economists.

"We had to decide whether to aim our statement at discussion of the industry generally, or only narrowly at our own company," Jurow said. The decision: to confine the statement to Schering's own actions, to seek no conferences with other companies, or with any of Kefauver's staffers. "We wanted to give no intimation we were guilty of anything or even worried," Brown said.

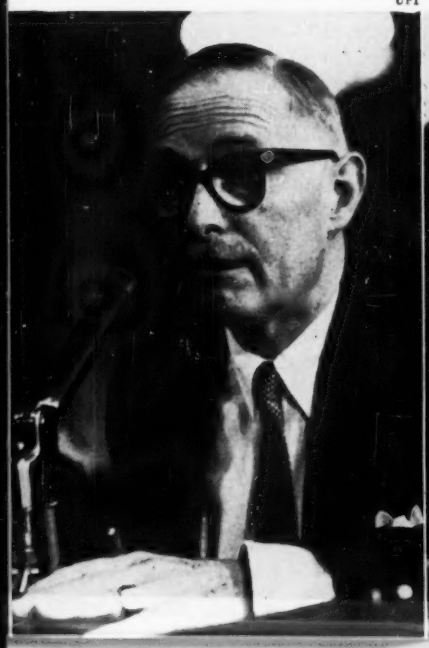
On Nov. 18, Schering's Washington public relations representative informed the company that Sen. Kefauver was to hold a press conference that day. At this conference, Kefauver announced the first subject for hearing would be the steroid hormone drugs.

Later that morning, Brown got his first direct call from the committee.

Counsel Paul Rand Dixon said a letter was being mailed inviting Brown to be the first witness to testify on Dec. 7-8.

"I asked him what was the subject matter of the letter," Brown said, "but he said he preferred that I read the

UPI



UPI

WIDE WORLD

reflects Merck's cost picture, indicating another markup of more than 1,000%.

Sharp Words: The companies clashed sharply with Kefauver for two days over these cost estimates.

Merck's John Connor cited figures on the steroid Decadron, sold to druggists for 14.2¢/pill: total cost, 10.7¢; markup, 3.5¢ (33⅓%); profit after taxes, 1.68¢.

Promotion Costs Attacked: Promotion costs drew the committee's concentrated fire. Staffers noted that 15,000 "detailers" call regularly on the nation's 150,000 doctors.

The industry defended the necessity of this service by pointing to the steady stream of new products. But it received a blast from Johns Hopkins Professor Louis Lasagna for carrying on a "pharmaceutical numbers racket" by pushing a host of new products he called no better than the old ones.

And he charged Merck with making "improper" claims about Decadron in its brochures by implying "a safety for the drug which I do not believe it possesses."

Lasagna was immediately answered by Nobel Prize winner Phillip Hench, professor of medicine at the Mayo Foundation. Merck's claims, he testified, were "perfectly all right" as "generalizations."

When the hearings resume in January, they will cover other products, including antibiotics, tranquilizers, vaccines, and vitamins.

(Continued from preceding page)

letter. I asked him to read the letter to me, and he refused. I asked whether we could send a representative to the Hill to get the letter or copy, and he declined."

So Schering had 10 working days, finally, to prepare a statement. After Thanksgiving weekend, Brown went down to his Delray, Fla., house to write his statement "and prepare myself physically for a taxing experience." His rough draft was reduced to 10 pages after he arrived in Washington last week, for final consultation with his treasurer, general counsel, and other advisors.

The importance of the kind of impression he would make took up much of the discussion. "We wanted a clear image of a businessman—important since the inquiry was beginning against the backdrop of the recent TV, 'payola,' labor racketeering scandals," an official recalls.

But his months of conscientious planning did not prepare Brown for the treatment he received.

Brown's advice to other businessmen facing hostile Congressional committees: "Use the most bald attack. You can be respectful to the office of Senator and still be tough." He said that he would deal more with Republican members and staff of the committee, if he had to do it again. They can help; they can challenge, he said.

"Don't be afraid," he said. "Really, to get ready for this, you ought to hire some back alley fighters to toughen you up for the show."

CPI Chances in Asia

Southeast Asia—an area systematically shunned thus far by most U.S. chemical companies—is offering an increasing number of chemical investment opportunities.

In Malaya, for example, Standard Vacuum Oil Co. plans to sink $30 million into an investment program that will include an oil refinery and fertilizer plant. It all depends on whether the government includes the projects in its "pioneer industries" program. This would give Stanvac a number of inducements, including a five-year tax exemption.

And a group of Malayan businessmen are awaiting "pioneer-industry" approval of a projected $10-million tire plant, for which Dayton Rubber would provide technical help, construction and operation supervision on a long-term contract.

A recent survey by Conlon Associates (San Francisco), consultants specializing in Asia, cites a number of chemical plants desired by the government: carbon dioxide, minimum capacity of 2 metric-tons/day; caustic soda, 5 tons/day; soda ash, 25 tons; ammonia, 10 tons; sulfuric acid, 10 tons; hydrochloric acid, 3 tons; nitric acid, 5 tons; ammonium sulfate, 50 tons.

And for investors willing to risk a more volatile political outlook, South Vietnam is considering some chemical projects open to minority foreign participation: a 33,000-metric tons/year urea plant, expandable to 80,000 tons; a 6,000-tons/year calcium carbide plant; and a 1,500-tons/year acetic acid plant.

Esso TV Topic: Unions

In a sweeping departure from the usual, Standard Oil Co. of New Jersey last week took to television to air its views on a forthcoming union election. The company bought two 45-minute time slots on a New York-area television station, put top management of its Bayway refinery on an informal program titled "Organized Labor."

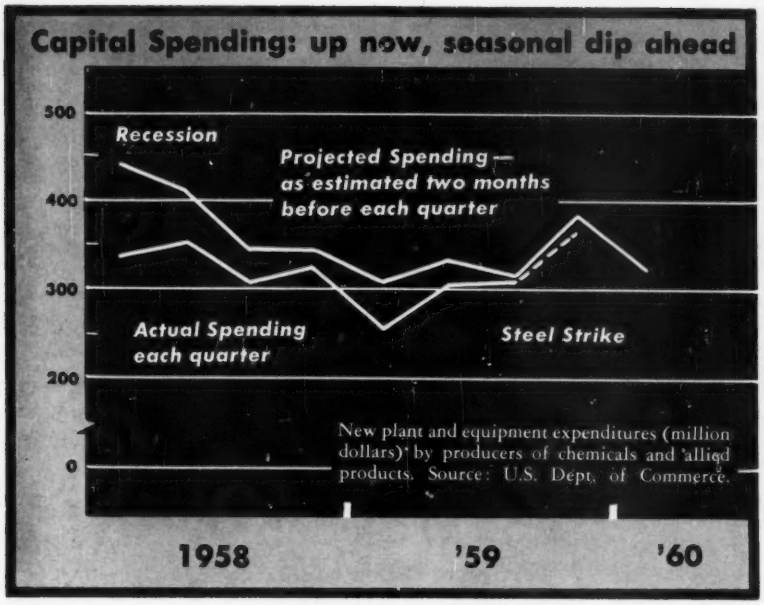
Using a man-to-man approach aimed at employees, management expressed its views on a National Labor Relations Board election called for Feb. 25, '60. The election is to determine whether workers will be represented by an international union or continue with the existing independent bargaining group.

The program was kept strictly informal, except for a 10-minute address by the refinery manager, Ross Murrell. Its unsophisticated, nonprofessional approach was striking. Both good and bad practices and policies in the past and present were put up for inspection and discussion.

Pitch: Top refinery management reviewed the results of a recent survey of first-line supervisors that turned up lower-echelon complaints about the extent of their authority. Management announced its intention to right any wrongs and to rebuild within the existing framework a strong management-employee-union relationship. By acknowledging what had been wrong, what must be done in the future to ensure progress, management emphasized that "we can solve our own problems" or "be a target for an international union."

Manager Murrell reviewed the accomplishments of the employees' independent union, but insisted that with certain planned improvements "we can do the job better without outsiders."

The Bayway election will be the third in a series of battles between international and independent unions to represent refinery workers in the Standard of Jersey organization. Several months ago, Oil, Chemical & Atomic Workers (AFL-CIO) won bargaining rights at the Humble Oil refinery at Baytown, Tex.; and last fortnight, the Independent Industrial Workers Assn. trounced both the Teamsters and OCAW in heavy voting at Esso's Baton Rouge refinery.



Poised for an Upswing

The chemical process industries are poised for a '60 take-off in capital spending, sales volume, and earnings.

All this—provided, of course, that business won't falter because of another steel strike, a railroad strike, or some other economic malignancy—is construed from two industry reports out of Washington this week: the quarterly survey on businessmen's plans for new plant and equipment expenditures, and the quarterly financial report for manufacturing corporations.

In capital spending, all of the six major process industry groups have substantially increased their outlays this quarter. And their anticipated outlays for the first three months of '60 indicate a generally higher level of investment next year than in any previous year except '57.

Chemical Spending Up: Producers of chemicals and allied products are putting out an estimated $362 million for new plant and equipment this quarter—representing a 16.8% gain over third-quarter spending and an 8.6% rise over last year's fourth-quarter total (*chart, above*).

Chemical manufacturers predict expenditures of $324 million for the January-March period; and considering that winter is usually something of a slack season for plant construction projects, government statisticians figure that this indicates a $1.42-billion investment level for the year as a whole. By comparison, chemical companies appear to be spending $1.23 billion for expansion and modernization this year, versus the $1.32-billion total in '58 and the $1.72-billion peak expenditures in '57.

This year's capital spending by primary nonferrous metals companies is down 25.8%, to about $327 million. But the other process industries all report higher outlays this year: paper and allied products, up from $578 million in '58 to $625 million in '59; petroleum and coal products, up from $2.43 billion to $2.48 billion; rubber products, up from $134 million to $194 million; and stone, clay and glass products, up from $399 million to $547 million.

Profits Fell Faster: Third-quarter operating figures show the CPI companies' mixed reactions to the July 15-Nov. 7 steel strike and various seasonal factors (*table, below*). Particularly to be noted: the disproportionate drop in profits, compared with small declines in sales. However, process industries' earnings held up much better than those in other manufacturing lines.

For producers of chemicals and allied products, nine-month operating totals are higher than in any previous year. Nine-month sales are up 17.7%, to nearly $20.5 billion; and chemical earnings for the first three quarters of '59 amount to $1,663 million, up 42.1% from last year.

But the $833 million set aside for depreciation failed to cover the period's capital outlays, $872 million.

Sizing Up the Steel Strike's Bite

Source: FTC, SEC. Dollar figures in millions.

	SALES		EARNINGS	
Industry group	*3rd qtr. 1959*	*Change from 2nd qtr.*	*3rd qtr. '59*	*Change from 2nd qtr.*
Chemicals and allied products	$6,919	—3.4%	$562	— 7.4%
Paper and allied products	3,031	+1.0%	158	— 4.8%
Petroleum refining and related industries	7,232	+5.6%	635	+ 6.8%
Rubber and miscellaneous plastics products	2,186	—5.3%	89	—12.7%
Primary nonferrous metals	2,286	—8.6%	116	—33.3%
Stone, clay, and glass products	2,373	+0.7%	215	— 6.9%
CPI totals	24,027	—0.6%	1,818	— 5.1%
All manufacturing industries	88,136	—0.3%	3,821	—21.3%

EXPANSION

Pulp, Paper: Southern Land, Timber and Pulp Corp. (Atlanta, Ga.) is planning to build a $40-million pulp and paper mill in southwest Georgia. The recently organized firm has acquired approximately 90,000 acres of timberland in Georgia and Alabama, and members of its board of directors are said to own an additional 400,000 acres. Initial capacity would be 400 tons/day.

•

Coal-Tar Chemicals: U. S. Steel's Tennessee Coal & Iron Division will expand by more than 100% the distillation facilities at its coke and coal chemicals works at Fairfield, Ala. The project is scheduled for completion by next summer.

•

Titanium Pigments: British Titan Products Co. (London) has organized a subsidiary, British Titan Products (Canada) Ltd., to build and operate a $16-million titanium pigment plant at Sorel, Que. A tract of land has been acquired near the plant of Quebec Iron & Titanium Corp., which will supply titanium slag—about 15,000 tons/year—to the new pigment plant.

•

Plastic Containers: Owens-Illinois Glass Co. (Toledo, O.) will build a plant at North Kansas City, Mo., to make semirigid plastic bottles, and will expand capacity for such products at St. Charles, Ill., and Glassboro, N.J. This boost in O-I's capacity for high-density polyethylene containers results from growing demand by makers of liquid detergents and other household products. In addition to these U.S. plants, O-I is preparing to build a similar plant at Toronto, Ont., for its International Division.

•

Pharmaceuticals: Strong Cobb Arner, Inc. (Buffalo, N.Y., and Cleveland) is contemplating construction or purchase of a large, modern, one-floor plant with room for expansion. Object: to replace both of the company's existing plants, located at Cleveland and Buffalo.

COMPANIES

Minnesota Mining & Mfg. will build a $10-million, 14-story administration building at its research center near St. Paul. It's slated to be completed early in '62.

•

Rohm & Haas Co. of Canada has formed a new division to handle cross-Canadian sales of acrylic and modified acrylic sheet and molding powder.

•

Dow Chemical of Canada has acquired Bradshaw's Ltd., plastics, paper, and foil packaging maker. Bradshaw's has plants in Toronto and Montreal.

•

Olin Mathieson has picked up full ownership of Almetco, Inc. (Nesquehoning, Pa.) by purchasing the 50% interest held by Textron, Inc. OM and Textron set up Almetco last year to operate an aluminum extrusion plant.

•

Tousey Varnish Co. (Chicago) has purchased all the outstanding stock of A. H. Climo Co. (Cleveland)—also a paint and varnish producer—for an undisclosed price. Climo has plants in Chicago and East Moline, Ill.

•

Brown Co. (Berlin, N.H.), paper manufacturer, has acquired Resi-Chem Corp. (Swanton, O.), producer of wet-strength resins for papermaking, adhesives for plywood, and synthetic resins. Brown had held 50% interest in Resi-Chem for the past three years.

•

Pennsalt Chemicals will pay a 10¢/share extra year-end dividend. Total dividends paid this year: 66⅔¢/share, compared with 61⅔¢ last year.

FOREIGN

Fertilizers/Central America: The new Central American common market's first major industrial project will probably be a complex fertilizer (chemically combined nitrogen, potash, phosphorus) plant. Sponsors say it will be designed to eventually fill all the area's needs. The plant will be built in Costa Rica or El Salvador by Fertilizantes de Centro America (Ferticas), a new company 50% owned by International Development & Investment Corp. (Nassau, Bahamas)—which is a joint venture of Chemical and Industrial Corp. (Cincinnati) and Phoenix-Rheinrohr (Dusseldorf, West Germany). Central American financial groups own the other 50% interest in Ferticas. First stage will cost about $10 million, will have a capacity in the range of 400 tons/day, plus 250 tons/day of ammonium nitrate. Later, expansions will increase acids capacity or will add urea facilities. IDI, incidentally, plans to put up three other fertilizer plants in Latin America.

•

Pharmaceuticals/France: Mead Johnson & Co. (Evansville, Ind.) has made its first manufacturing investment in Europe by acquiring a "substantial interest" in Laboratoires Allard (Paris).

•

Benzene/United Kingdom: Port Talbot Chemical Co. Ltd., a joint venture of Steel Co. of Wales and the Lincolnshire Chemical Co., will build a plant to refine coke-oven crude benzene. Capacity — 4.5 million gal./year of crude—can eventually be doubled.

•

Plastics/Netherlands: Holland is planning an international plastics fair—"macroPlastic 1960"—for Oct. 19-26, in Utrecht.

•

Dye Intermediates/India: Farbenfabriken Bayer will build a dye intermediates plant near Bombay in partnership with the Indian government. The German company will hold at least a 51% interest.

Convert a gallon of liquid to a powder with 28¢ worth of

MICRO-CEL

SYNTHETIC CALCIUM SILICATES

PROBLEMS IN PROCESS formulatings are finding new answers every day in Micro-Cel . . . Johns-Manville's new line of synthetic calcium silicates.

At a delivered cost of 8¢ to 10¢ per pound Micro-Cel can match—even outperform—many higher-priced fillers in dry or liquid products. Check these three cost-cutting product improvements Micro-Cel can give you.

1. MICRO-CEL remains a free-flowing powder even when mixed with more than twice its weight of liquid . . . provides ultimate absorption of up to six times its weight in water . . . controls viscosity . . . prevents caking.

2. IN DRY PRODUCTS, Micro-Cel will bulk up to a full cubic foot for every six pounds. A little Micro-Cel goes a long way toward improving product density, reducing package outage.

3. MICRO-CEL particles are as small as .02 micron, blend and disperse well, extend pigments to the maximum.

Micro-Cel, the powder that flows like a liquid, is a new line of inert synthetic calcium silicates produced by combining lime with diatomaceous silica under carefully controlled conditions. Its unique combination of properties has already brought important benefits and savings to many processors. *Maybe you will be next.*

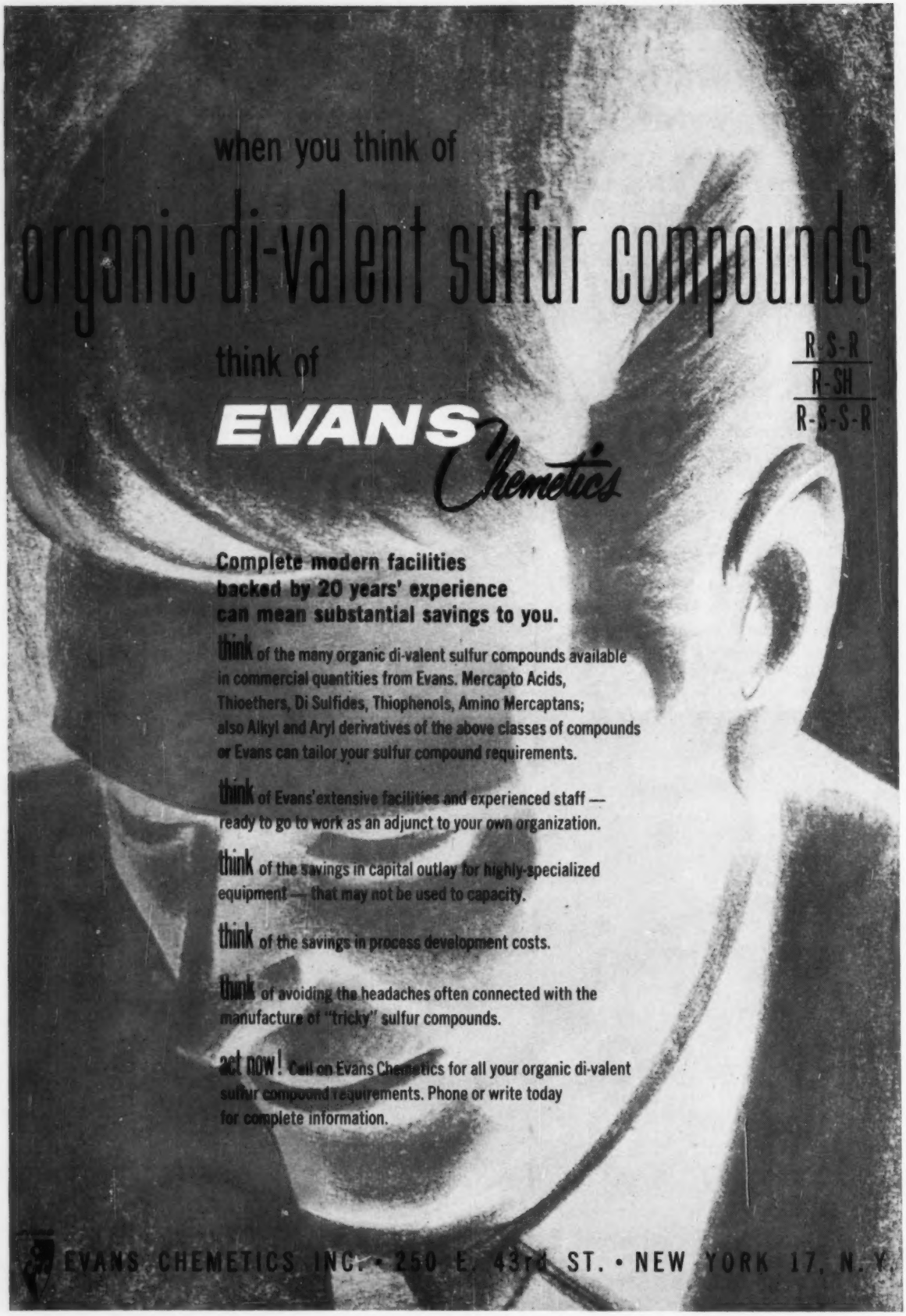
For further information, samples and technical assistance write to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

You can absorb a gallon of liquid with 3 lb. of MICRO-CEL

and get a dry free-flowing powder like this ➡

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville MICRO-CEL
A product of the Celite Division


when you think of
organic di-valent sulfur compounds
think of
EVANS Chemetics
R-S-R
R-SH
R-S-S-R
Complete modern facilities
backed by 20 years' experience
can mean substantial savings to you.
think of the many organic di-valent sulfur compounds available in commercial quantities from Evans. Mercapto Acids, Thioethers, Di Sulfides, Thiophenols, Amino Mercaptans; also Alkyl and Aryl derivatives of the above classes of compounds or Evans can tailor your sulfur compound requirements.
think of Evans' extensive facilities and experienced staff — ready to go to work as an adjunct to your own organization.
think of the savings in capital outlay for highly-specialized equipment — that may not be used to capacity.
think of the savings in process development costs.
think of avoiding the headaches often connected with the manufacture of "tricky" sulfur compounds.
act now! Call on Evans Chemetics for all your organic di-valent sulfur compound requirements. Phone or write today for complete information.
EVANS CHEMETICS INC. • 250 E. 43rd ST. • NEW YORK 17, N. Y.

Washington
Newsletter

CHEMICAL WEEK
December 19, 1959

A new rumpus over government patent policies is shaping up. At issue: the differences in policy among federal agencies. There are drives under way—by industry people and some sympathetic Administration officials—to liberalize policy. But there's a counterdrive—notably by Congressional Democrats—to tighten up on the patent system, to restrict industry's rights to inventions made under government-sponsored research and development projects.

Here's how patent policies on government contracts now stack up:

• On Defense Dept. R&D contracts, the contractor keeps title to the patent and has the right to royalties on commercial use. The military services, however, get royalty-free, nonexclusive licenses.

• On AEC contracts, the agency acquires rights and interests in all inventions.

• On National Aeronautics & Space Administration R&D contracts, the agency must take title to the invention or waive all rights. NASA, unlike the military services, cannot settle only on licensing rights. But NASA contractors complain that the waiver procedures are so "cumbersome and uncertain," that in effect the agency's policy is as restrictive as AEC's. NASA itself has proposed liberalization, but any change will require legislative action. The agency's idea is to provide for "discretionary" or flexible authority. This would allow NASA to decide whether to take title to the invention (the way AEC does) or to limit itself to licensing rights (the way the military services do). NASA contractors advocate bringing the agency's patent policies in line with the Pentagon's.

The outlook for any liberalization is uncertain. Congressional critics of the policy allowing contractors to hold patents on any inventions resulting from government-financed R&D projects plan an all-out fight for new restrictions.

•

An attempt to correct the inequities of the "cancer clause" in food additives legislation may be made by Health, Education & Welfare Secy. Arthur S. Flemming. The problem was pointed up last week in his action banning use of diethyl stilbestrol to fatten chickens.

Flemming, after considerable consultation with the drug and poultry industries, arranged a halt to the production and sale of chickens treated with the chemical. The ban is based on lab tests that show that cancer can be induced in animals treated with heavy doses of this synthetic hormone over a long period of time.

Lessons learned from the cranberry scare were applied to minimize the impact on the industry. Flemming had planned to call a press conference two weeks ago when the lab tests were turned in. But he de-

layed the public announcement, contacted the industries affected, tracked down the affected chickens (constituting only 1% of the total poultry supply) to New York and Los Angeles outlets, arranged for the Agriculture Dept. to buy up the treated poultry, then made the plan public.

Stilbestrol can still be used as a feed additive for beef (the biggest market), mutton and lamb, since not even the two-parts-per-billion residues found in poultry have been found in meat. Flemming is giving some thought to proposing a change in the food additives amendment, which rules out any cancer-inducing additive in foods, generally—and in animal feed, even though no residue shows up in the meat. He doesn't see—and the chemical industry agrees—why a product should be banned just on principle, when it causes no harm to the consumer and is beneficial in producing better meat.

The inequity is compounded by the fact that feed formulations licensed before the food additives amendment went into effect can continue to be made. But no new permits may be issued. This in effect just restricts competition. The old permits cannot be revoked unless the Food & Drug Administration proves the substance is harmful.

How far Flemming can get with Congress in compromising a scare word like cancer remains to be seen.

About 130 makers and packagers deal in diethyl stilbestrol and feed premixes containing it, but Eli Lilly is the principal producer.

•

Possibility of antitrust violations in tranquilizer sales is under grand jury investigation. Justice Dept. antitrusters have been at work for several weeks with a grand jury in New York City. Principal purpose of the probe is to find out if manufacturers have entered into any price-fixing arrangements or understandings on the sale of tranquilizers.

The grand jury action could result in criminal indictments or the filing of civil charges, or both. The study was launched after preliminary investigations by the antitrusters, looking into complaints from the public that various members of Congress passed along to the Justice Dept.

•

Rexall Drug Co., fighting government seizure of its chewing gum, says the gum is not represented as a treatment for obesity. The Justice Dept. seized 43 cartons of Rexall Slim-Pac under the Food & Drug Act, charging that the product's labeling misleads the public.

Rexall's formal reply in New York federal district court says the product is represented merely as "designed for appetite reduction, which, in turn, tends to prevent overeating, which causes obesity." A government victory in the case would effectively ban further shipments of the gum.

METAL CHLORIDES

Chlorides of Aluminum, Antimony, Boron, Columbium, Silicon, Tantalum, Titanium and Zirconium in commercial quantities; chlorides of Chromium, Germanium, Tin and Vanadium in research or developmental quantities.

METALLO-ORGANICS

More than 300 organic, inorganic and metallo-organic chemicals are available from Stauffer's Anderson Chemical Division (Weston, Mich.); some in commercial, others in research or developmental quantities.

CATALYST SUPERMARKET

You will find a catalyst for almost any purpose among Stauffer's broad range of chemical products. They cover the chemical front from Al to Zr...are available in quantities for research or production...from ampules to tank cars... from 17 sources of supply coast to coast. Note the many types available:

MINERAL ACIDS

Hydrofluoric, Muriatic, Nitric and Sulfuric Acids available in drums to tank cars.

BROCHURES AVAILABLE

Metal Chlorides (36 pages)
Metallo-Organics (40 pages)
Hydrofluoric Acid (40 pages)
Muriatic Acid (44 pages)

Aluminum Alkyls are now available in developmental quantities and will be available in commercial quantities late this year.

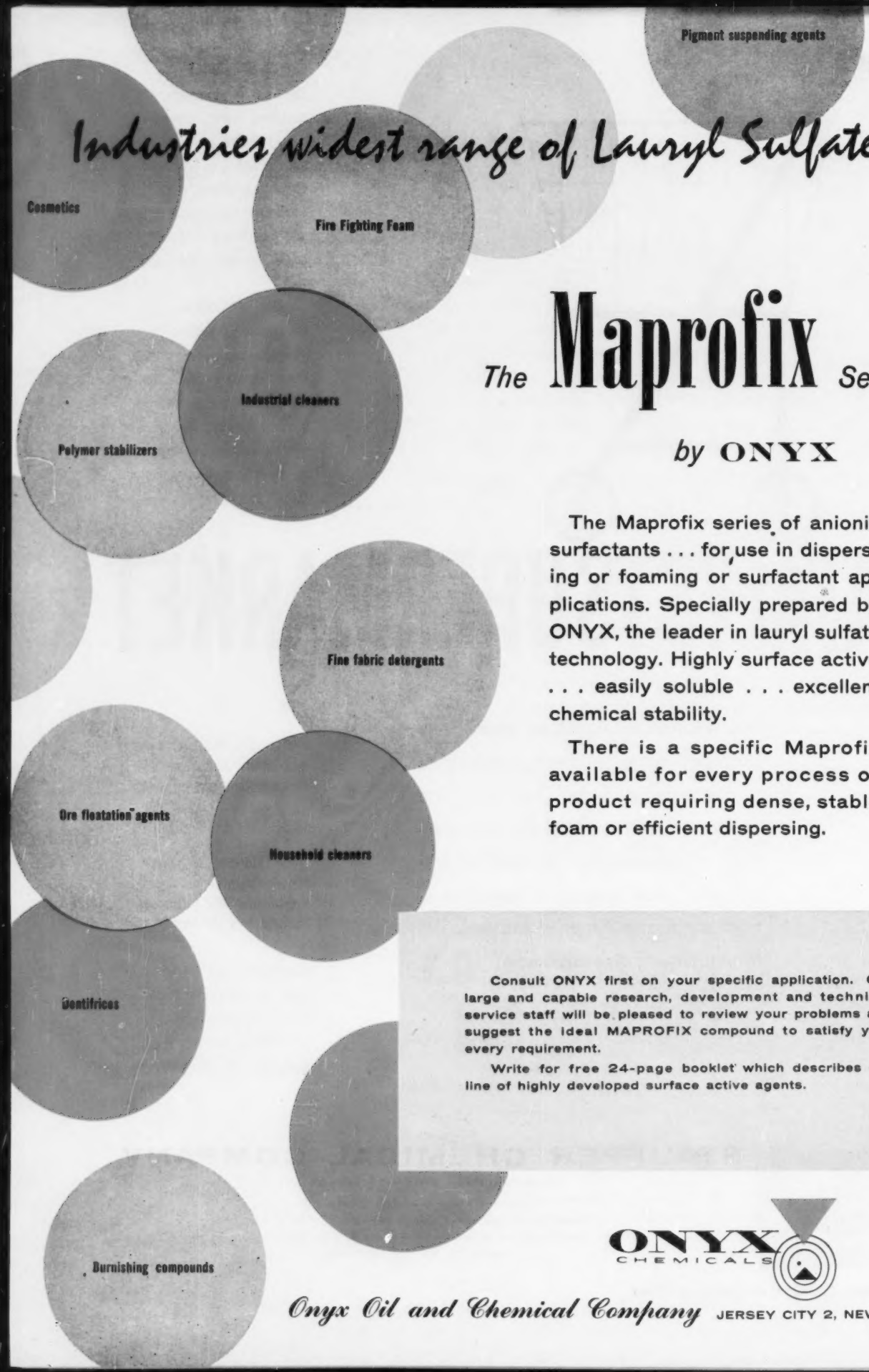
Stauffer CHEMICALS SINCE 1885

STAUFFER CHEMICAL COMPANY

380 Madison Avenue, New York 17, New York

Prudential Plaza, Chicago 1, Illinois
824 Wilshire Boulevard, Los Angeles 17, California
636 California Street, San Francisco 8, California
P. O. Box 9716, Houston 15, Texas

Industries widest range of Lauryl Sulfates



The Maprofix Series

by ONYX

The Maprofix series of anionic surfactants . . . for use in dispersing or foaming or surfactant applications. Specially prepared by ONYX, the leader in lauryl sulfate technology. Highly surface active . . . easily soluble . . . excellent chemical stability.

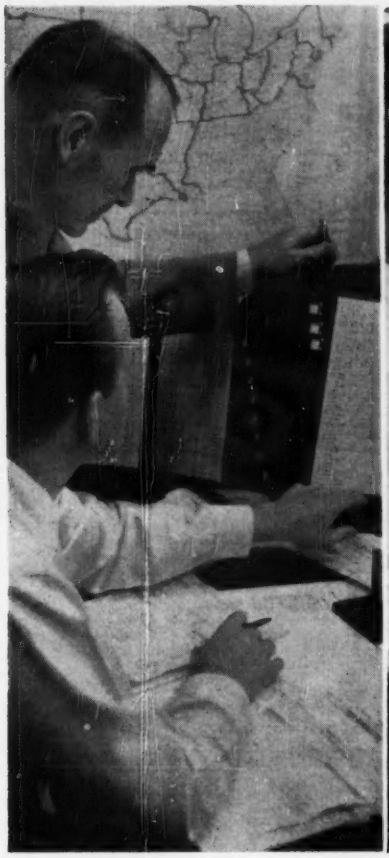
There is a specific Maprofix available for every process or product requiring dense, stable foam or efficient dispersing.

Consult ONYX first on your specific application. Our large and capable research, development and technical service staff will be pleased to review your problems and suggest the ideal MAPROFIX compound to satisfy your every requirement.

Write for free 24-page booklet which describes our line of highly developed surface active agents.

ONYX CHEMICALS

Onyx Oil and Chemical Company JERSEY CITY 2, NEW JERSEY



1 Saran Lined Pipe Co.* checks orders before they are . . .

CW PHOTO—GENE PYLE

2 punched on paper tape for leased-wire transmission to . . .

CW PHOTO—GENE PYLE

3 supplier Dow. Two machines type shipping orders, invoices.

Automatic Ordering Slashes Selling Costs

Chemical process industries management generally credits two factors for improved earnings positions the past year: operation at high level of capacity and cost reduction. Last week, Dow Chemical Co.—one of a number of CPI concerns whose '59 earnings have improved by a "considerably greater margin than sales"—emphasized the latter point. It put the finishing touches on a new automated order-entry system.

Dow's system saves approximately 200 clerical man-hours/month, $80/-month in telephone costs, further advances the relatively new and rapidly developing trend toward application of integrated data-processing and automated order-entry systems.

*Standing: Saran's President Stewart Blackmore.

Speeds Orders: Dow's system (installed by Michigan Bell Telephone Co.) permits more rapid and better-organized transmission of approximately 1,200 orders monthly between Dow's Saran Fabrication Dept. at Bay City, Mich., and the department's major customer, Saran Lined Pipe Co., at Ferndale, 100 miles away. If the system proves out, it likely will be put into service to other customers.

The Dow department provides saran plastic linings for several different types and dimensions of metal pipe and fittings. Increased demand for pipe outmoded its previous order system, the company says, obliged it to seek a procedure that would speedily transmit orders regularly throughout the day and eliminate peak loads and uneven production schedules.

Integration Tried: Dow's corporate Office Methods Dept. worked with sales and operating personnel to develop the new automated order-entry system, which integrates forms and office and communication machines.

First step was to design integrated forms for sales orders, shipping instructions, packing slips, shipping labels and invoices used by both Dow and Saran Lined Pipe Co. Essentially, Dow management began from "scratch," because, although somewhat similar integrated and data-processing systems are in use by other firms (primarily for intercompany operations), Dow's needs and problems required a unique operation.

The second step was to put easily recognized product descriptions into abbreviated language to permit effi-

cient use of automatic writing machines (Friden Co.'s Flexowriter). Next, assembled information about end-use customers and product information was coded and put onto edge-punched file cards.

How It Works: Now, when Saran Lined Pipe Co. receives a purchase order by mail, phone or Teletype from one of its 26 sales offices, clerks first pull two or more cards from the file that refer to the customer and the products he wants. These cards are fed into the Flexowriter—an edge-punched file card business systems machine designed to prepare an original document and a by-product, a five-channel punched paper tape for wire transmission.

The automatic writing machine types "fixed" information from the cards at 110 words/minute, stopping automatically so that variable information can be added manually. About 15% of the order is typed manually.

The by-product tape, containing a composite of product and company data, is checked for accuracy against the customer's purchase order. It is then placed on a Teletype machine for transmission over private lines (leased from Michigan Bell) to Dow's Saran Fabrication Dept. plant.

This information is received on two Teletype machines (also leased from Michigan Bell). One machine receives shipping instructions, the other a partly completed invoice. The latter goes to the invoicing department, copies of the shipping instructions go to the shipping department and to the pipe company to acknowledge.

Numerous Benefits: Dow management expects many gains from the new system:

- Faster, more accurate service for the end-use customer (e.g., the pipe company's customer).
- Easy integration of other office automation techniques as they become available.
- Simultaneous and much faster preparation of original order, partial customer invoice, Dow shipping instructions, packing slip, shipping labels, and partial Dow invoice to its customer—all prepared separately and chronologically in the past.
- A 12- to 24-hour speedup of order reception by Dow's fabrication plant.
- Same-day shipment of most stock orders.
- Elimination of verbal instructions and manual transcribing of order information from one document to another.

International Automation: Not to be outdone in the automated order system area, Dow's home office at Midland plans to place in service by Jan. 1 another link in its worldwide communications system, which it began setting up in '46.

The newest link will be a Telex connection between Johannesburg, South Africa, and Midland. The order network already extends to Europe, the Far East, South America, Scandinavia and Australasia.

Dow's recent moves reflect the tightening of competition and the concomitant increase in costs of getting the sale. In the decade ahead, customers will be demanding faster shipment, greater accuracy, more customer services. There seem to be few ways to satisfy these growing demands, and at the same time cut sales cost, without such developments as automatic, integrated order-service systems and integrated data processing. Dow is convinced its current automated system is actually an important step in the right direction.

Posers for Bargemen

Inland waterway carriers now figure that the profits they make from next year's continued upswing in cargo tonnages will be accompanied by some serious problems. Major new worry: threat of increased government control; an old bugaboo: continuing railroad competition.

Concern over increased government control—voiced at recent association meetings of the American Waterways Operators—stems from a recent U.S. Coast Guard inquiry into the possible danger of moving chlorine barges in the same tows with petroleum products or other dangerous commodities. The Coast Guard hasn't yet taken action on the matter, but the water carriers fear any regulation that could limit their freedom in making up tows—the long "water trains" of barges that are pushed up and down the rivers by towboats.

Chlorine barges are safe, claim the water carriers, because they are constructed in compliance with Coast Guard regulations. Moreover, they add, no chlorine escapes from these barges in use, thus there is no danger of interaction with petroleum products carried in other barges. Water carriers hope for the support of the American Petroleum Institute in opposing any makeup regulation.

Barge operators also said they expect their efforts to hold on to traffic the railroads are after will make for a lively year in '60. Water carriers will continue their court fight against the rails' selective rate cuts, may take the fight to Congress. Key legislative issue for '60: "common ownership" bills aimed at permitting railroads to enter other fields of transportation. Bargemen, as well as truck and airline officials, believe these bills must be defeated.

Other important items in the water carriers' '60 plans include opposition to waterway tolls, lobbying against special discount rates granted all federal and state shipments.

Rubber Tank Ruling

Last week, the hard-fought struggle over the use of collapsible rubber tanks took a new turn. In the latest of a long series of hearings, an Interstate Commerce Commission examiner recommended that no federal restrictions be placed on the use of the versatile rubber tanks. Only new point in the opinion: that the tanks be limited to sizes under 1,000 gal.

This recommendation appears to be a compromise between the poles-apart positions of the tank-truck industry and the general-commodity carriers. Tank truckers oppose the use of the rubber tanks by general-cargo carriers, charge that they lack proper operating authority from ICC. At stake: the tank-truck operators' sizable investment in specialized equipment. Widespread use of the collapsible rubber tanks (on flat-bed trucks) conceivably could take big bites from tank-truckers' business.

Chemical process companies are watching the hearings closely, adding their support, through the National Industrial Traffic League, to unrestricted use of the tanks. CPI traffic managers figure the ICC opinion is a step in the right direction: unrestricted use of all tank sizes. They favor the tanks because they promise reduced shipping costs, less handling, possible rate reductions. (Carriers of bulk liquids often charge for the round trip

made by tank trucks when they cannot find suitable return cargoes.)

Final ICC decision on the controversial issue is not expected until next year. But judging from the firm stands taken by both sides, there will likely be plenty of action before then.

DATA DIGEST

• **Paper Tapes:** Brochure presents basic information on line of pressure-sensitive paper tapes, including construction, physical properties and applications. Permacel Tape Corp. (subsidiary of Johnson & Johnson, New Brunswick, N.J.).

• **Textile Chemicals:** Booklet lists company's line of textile chemicals. Included: antislip finishing agents, antistatic agents, detergents, dyeing assistants, dispersing agents, fumigants, lubricants, mercerizing assistants, mordants, resin intermediates, shrinkage control agents, thickeners, water repellents, and wetting agents. Booklet also gives formulation and physical property data and literature references. Union Carbide Chemicals Co. (New York).

• **Low-Temperature Testing:** Brochure discusses uses of carbon dioxide for low-temperature environmental testing. Included: principal testing methods now in use, check list of major advantages of carbon dioxide, list of various supply systems provided for testing. Pure Carbonic Co., division of Air Reduction Co., Inc. (New York).

• **Acrylic Polymer:** Booklet highlights properties of acrylic resin, Baker PL-11, claimed to possess better solvent and craze resistance and higher heat-distortion temperature than polymethyl methacrylate. J. T. Baker Chemical Co. (Phillipsburg, N.J.).

• **Fatty Acids:** New 22-page booklet describes properties and applications of fatty acids produced from tall oil. Tables gives property and composition data. Typical applications: alkyd resin vehicles for protective coatings, plasticizers. Hercules Powder Co. (Wilmington 99, Del.).

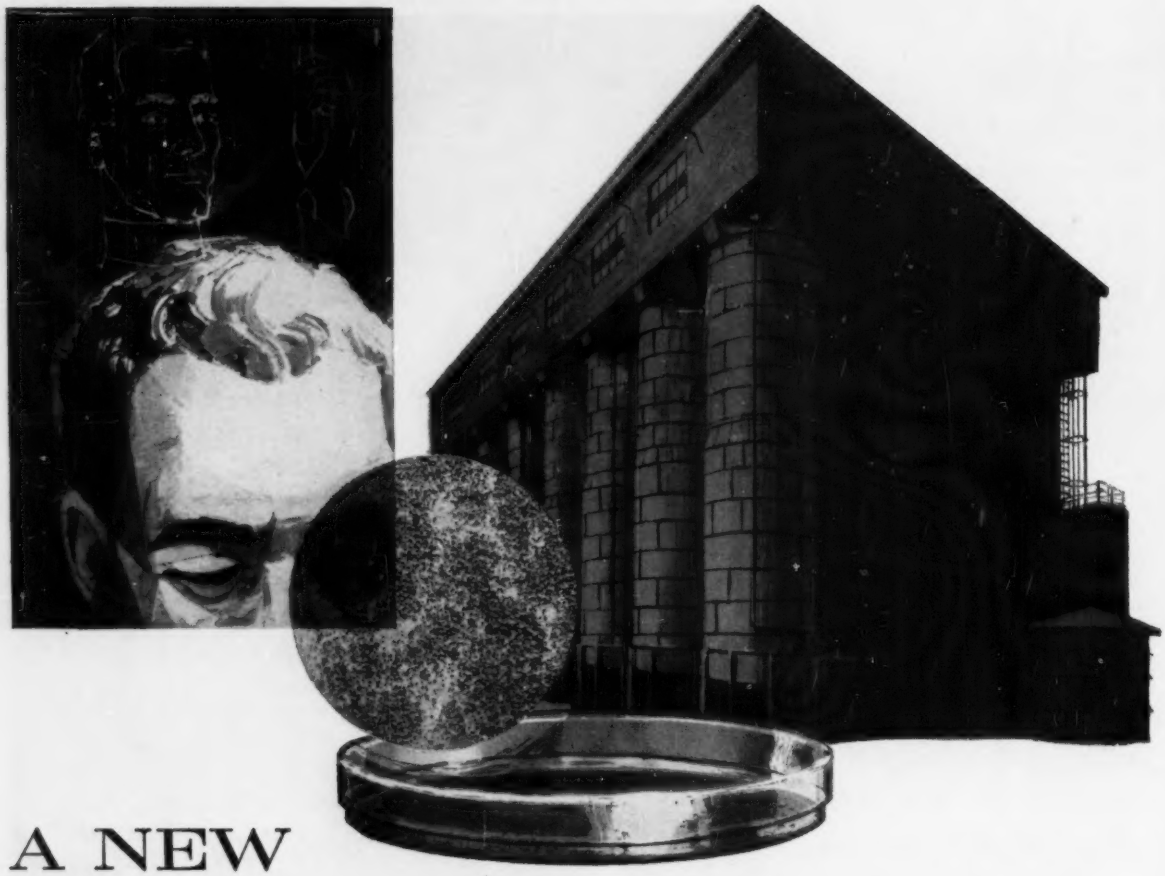
• **Government Specifications:** Catalog lists company's line of chemical products by federal and military specification numbers. Includes adhesives, sealants, coatings, chemicals, paints. Government Sales Dept., Magic Chemical Co. (Brockton, Mass.).

nothing
equals
piccopale

Inert, heat stable and pale in color, PICCOPALE assures the utmost in water and moisture resistance through its unique chemical structure.

The trademark of quality

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION
CLAIRTON, PENNSYLVANIA



A NEW
basic source for CITRIC ACID, U.S.P.

Here is an unusually pure citric acid produced in the Midwest by Miles Chemical Company's unique deep fermentation process. Ready for immediate shipment in truck-load quantities.

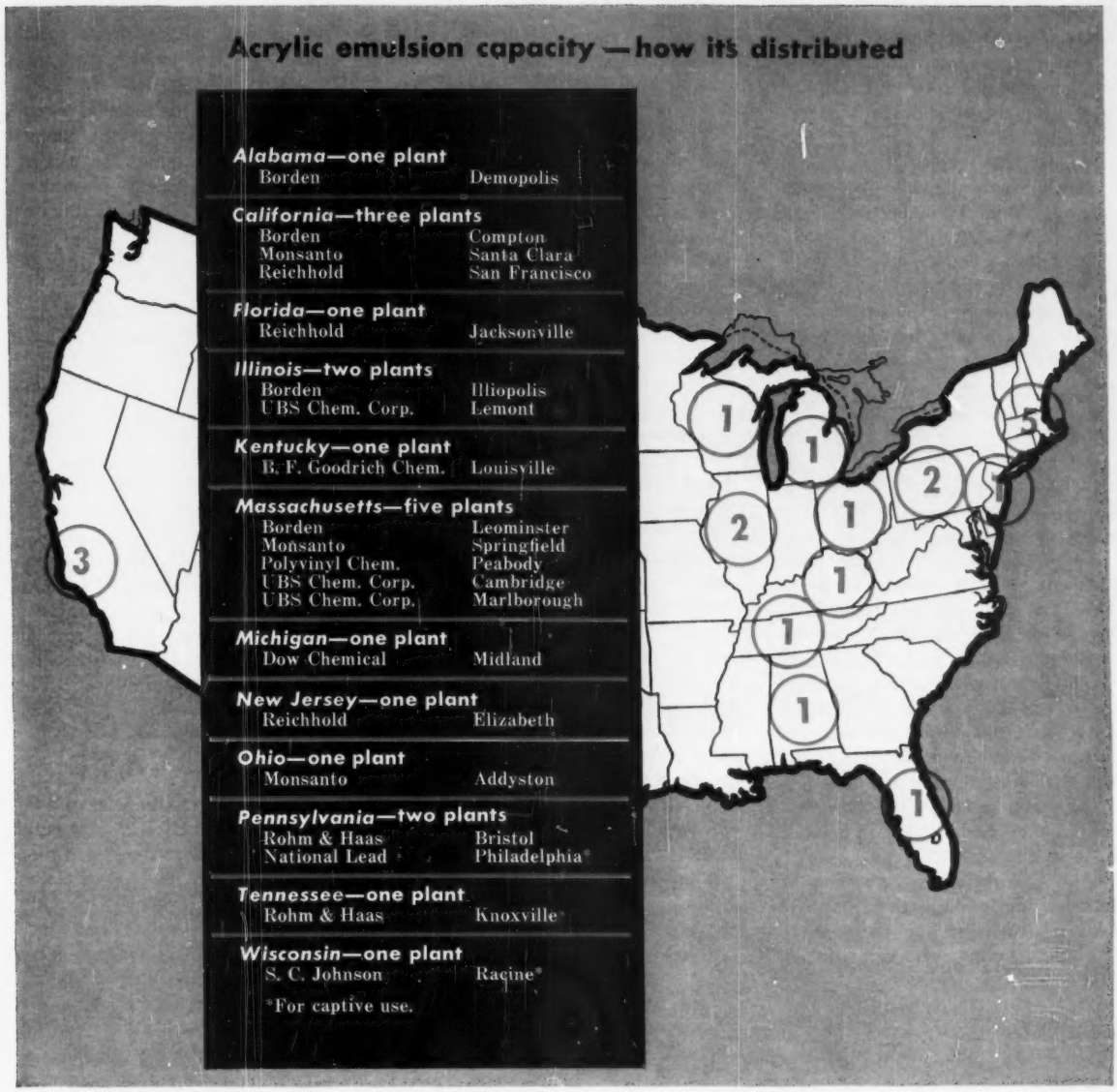
For years Miles has produced a considerable volume of citric acid mainly for its own use in pharmaceuticals. A unique deep fermentation process, pioneered by Miles, yields a product remarkably free from contamination and meets Miles' most strict purity and mesh specifications.

This deep fermentation capacity has been expanded to provide a reliable, large volume supply of citric acid, U.S.P. for the open market. It's ready for shipment when and where you need it. Our plant is centrally located . . . a convenient producing point with excellent transportation routes in all directions.

Write for full details. A Miles Chemical representative will be happy to discuss your requirements at your request.

Miles Chemical Company

division of Miles Laboratories, Inc.
Elkhart, Indiana



Emulsion Makers Map New Acrylic Growth

This week, Borden Chemical Co. started production of acrylic emulsions at its Demopolis, Ala., plant; and within the next two or three weeks, Monsanto will complete its new plant at Addyston, O.

The latter will double Monsanto's acrylic emulsion capacity.

Both developments are part of a rash of expansions the past year as producers have jockeyed for position to supply the expected "dynamic growth" predicted for acrylics.

Indicative of the activity: of the 18 major noncaptive producing plants (*listed above*), half were completed in '59, with more to come in '60.

Eight major commercial producers are currently vying for the acrylic emulsion business in the U.S. Their output is augmented by that of two other companies with plants supplying their own captive requirements, in addition to production by several smaller plants. Until '59, a big portion of these plants were bunched in the New England area—largely in Massachusetts, where four of the 11 U.S. acrylic emulsion plants were located. But, during the past year, acrylic emulsion production was extended into all parts of the U.S. (*see chart*), particularly on the West Coast.

Two plants were started in California, making three such units there. Until Borden and Reichhold started

production at Compton and San Francisco, Monsanto—with its Lytron 680 modified acrylic*—was the only West Coast producer, at Santa Clara, Calif. At the present time, Monsanto is installing new facilities to triple their output of the acrylic-type binder at this plant.

Although all acrylic emulsion producers are aiming at the West Coast market, not all will build there. Some have instead set up distribution points in the area. For example, Polyvinyl Chemicals Inc., probably the second largest acrylic producer in the U.S., will use R. E. Flatow & Co., Inc. (Oakland, Calif.), as its West Coast agent. Earlier this year, Polyvinyl Chemicals began boat shipments from Peabody, Mass., to bulk storage facilities on the West Coast, where the material is repackaged in drums. UBS Chemical Corp. maintains bulk storage at Los Angeles.

To South and West: Borden's most recent moves have been to the South and West (its Compton plant was opened earlier this year). Its facilities at Demopolis, the firm's fourth producing point, will give the company an additional 35 million lbs./year of acrylic emulsion output potential. At the same time, the location places the company close to the paper industry, an important target for acrylic emulsions. Other units are at Illiopolis, Ill., and Leominster, Mass.

C. W. Smith, general manager of Borden's Polyco-Monomer Dept., says the company is relying on a newly developed process, plus the strategic location of its four producing points, in seeking a larger share of the growing acrylic emulsion market. Details of the Borden process have not been disclosed.

Monsanto's now-expanding Addyston plant was also started up earlier this year. The additional facilities which are planned should be completed either before the end of '59 or in Jan. '60.

The Acrylic Chain: Since most acrylic emulsion producers do not make their own raw materials, they must buy acrylates from one of three suppliers—Celanese, Rohm & Haas, or Union Carbide. A fourth producer, Dow Badische, now has a plant under construction; it will be onstream in the first quarter of '60.

Rohm & Haas, however, is in both ends of the business, supplying acrylic raw materials and turning out acrylic emulsions. Supplier Celanese, although not yet committed on a large scale, currently has three acrylic emulsion products under market development. And Dow, which will receive monomers from Dow Badische next year, is now offering an acrylic emulsion to the paint trade.

So far, most emulsion producers have preferred to build new facilities — either new plants or bulk storage depots—near their markets, to minimize freight rates on their finished products.

Serious Excess? It is clear that with all the new facilities that have been installed during the past year, capacity is several times current demand. But this is not a serious problem, for two reasons: (1) since production of acrylic emulsions is either batch or semicontinuous, small additional capital outlays have been made to effectively increase capacity; (2) in most cases, other types of emulsion polymers can be made in the idle kettle.

Also, broadened acrylic applications—made possible by more versatile products—enable producers to sell some of their output in new markets.

Take the case of UBS Chemical. Besides adding two new producing points (Lemont, Ill., and Marlborough, Mass.) during '59, the company broadened its line of acrylic products to extend into almost all types of coatings. Little more than a week ago, the company, basically a producer of emulsions for floor polish, introduced a new acrylic-styrene emulsion for high-gloss, water-thinned interior paint. UBS is also working out acrylic emulsions for paper and textiles.

Most other producers are pursuing a similar program to broaden their line of acrylic emulsions, and it's a sure bet that '60 will bring many new acrylic-based products.

Acrylic Emulsion Outlets: The major market for acrylic emulsions, and the one that offers the most growth, is water-thinned paint. Currently, this market is held largely by butadiene-styrene, and polyvinyl acetate products; acrylics command only 11-13% of it.

Acrylic paints are being developed for both the indoor and the outdoor markets, although most growth is expected in exterior paints. Linseed oil paints now virtually dominate the outdoor market.

Other outlets that seem to offer promise: leather and paper finishing, and floor polishes. Although relatively high-priced, acrylics are still receiving a lot of attention in these applications. S. C. Johnson, for example, has marketed an acrylic floor polish since '57. And leather treatment is the second-largest outlet for acrylic emulsions; they are used in the base coat and more recently in the topcoatings.

It is this variety in market potential that has led acrylic emulsion producers to expand capacity to a level of demand that may not be reached for four years. Should the markets develop faster, the producers will be prepared to meet them.

*There is some confusion in the use of the term acrylic emulsions. Generally, it is applied to copolymers of ethyl acrylate and methyl methacrylate. But acrylate products containing various percentages of another monomer (generally a less-expensive one) are often also termed acrylic emulsions. Examples: acrylic-styrene and acrylic-vinyl copolymer emulsions. Since formulations are well-guarded secrets, it is often difficult to determine the exact composition of an emulsion. Monsanto's product is reportedly not a straight acrylic, although the company refers to it as an acrylic-type binder. In any case, many of the producers supply both straight and modified acrylics.

MARKETPLACE

Vanadium Moves Up: Sales of pure vanadium metal in '59 will show large gains over '58, according to Union Carbide Metals Co., division of Union Carbide Corp. In the first 11 months of '59, the company, a major producer of the metal, shipped more than seven times the quantity of vanadium it shipped during all of '58.

Part of the sales increase is attributed to recent availability of grades of vanadium with increased purity. But, Union Carbide Metals also reports an increase in the company's production of customer-requested mill products.

•

Dispersed Dye Price Hikes. Prices of ten dispersed dyes for synthetic textile fibers will be increased, effective Jan. 1, '60. Eastman Chemical Products, Inc., a subsidiary of Eastman Kodak Co. is posting the increases, which will range from 4¢/lb. for Eastone Rubine R, to 39¢/lb. for Eastman Yellow 5G, concentrates. According to an Eastman spokesman, this is the first increase involving more than one or two dyes since '57.

HOW *HERCULES* HELPS...

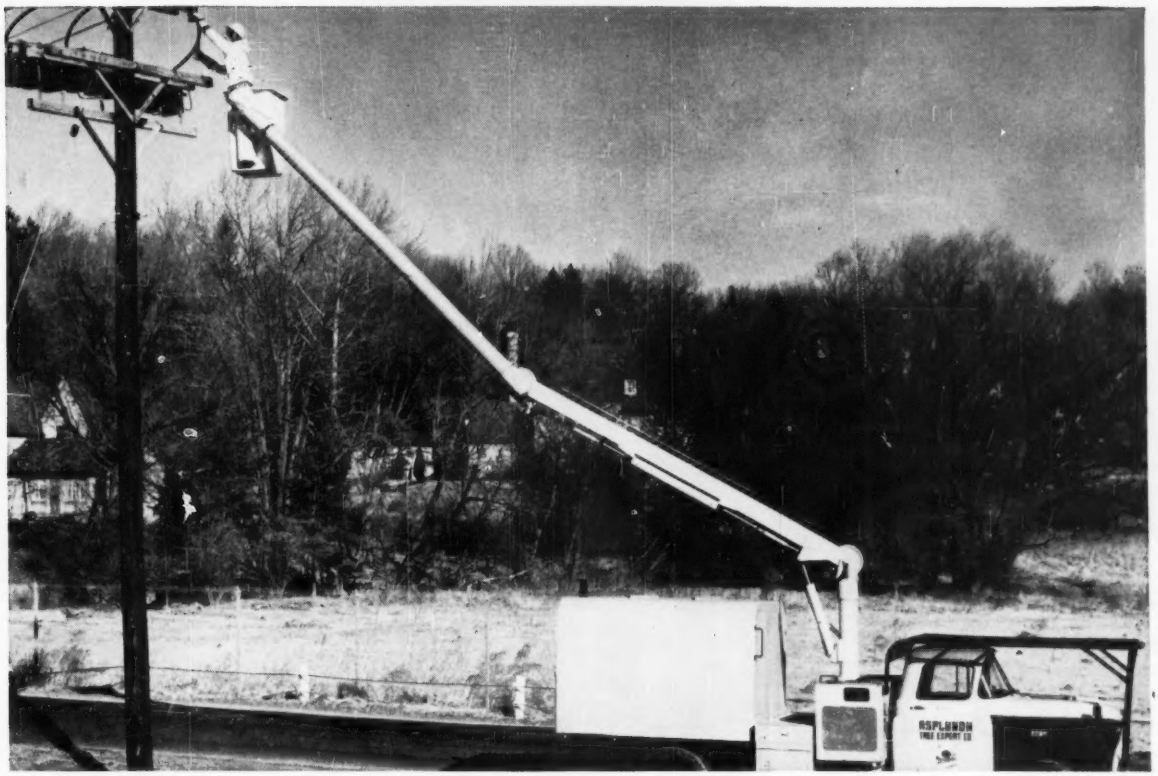


Photo courtesy Asplundh Tree Expert Co., Jenkintown, Pa.

MEN OVER THE WIRE—Spiralloy®, the filamentwound glass fiber-reinforced plastic material made by Hercules, is being used for booms on truck-mounted cranes of utility companies and tree surgeons. Since it is a nonconductor of electricity, Spiralloy is particularly well-suited for this application. Lighter than aluminum and stronger than steel, it has unmatched high-strength-to-weight ratio. Spiralloy-wound cylindrical structures also are gaining acceptance in such fields as missiles, boats, pipe, and storage tanks.

INCREASE SHOE LIFE—A new Hercules material now goes into specially impregnated leather shoe soles that actually "breathe" and have many times the wearability of leather soles. Developed in cooperation with the U. S. government, this product has already proven itself in many types of footwear.

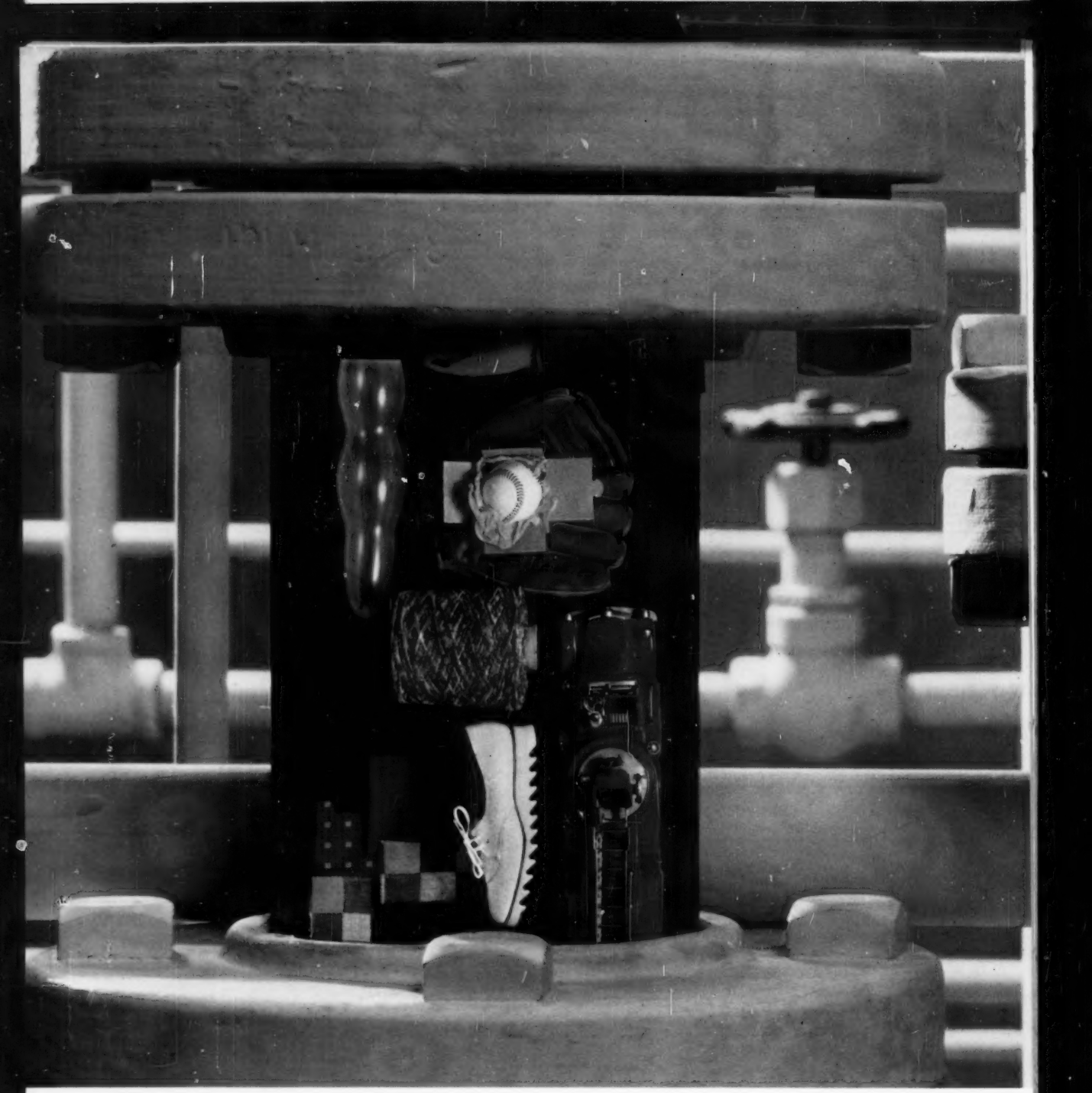
MAKE DRIVING ECONOMY—Among the many Hercules items that go into your automobile is Dalpac® 4, Hercules di-tert-butyl-p-cresol. This antioxidant is added to gasoline at the refinery to inhibit gum formation, stabilize color and help maintain engine cleanliness. It means more trouble-free miles of driving for you.

HERCULES

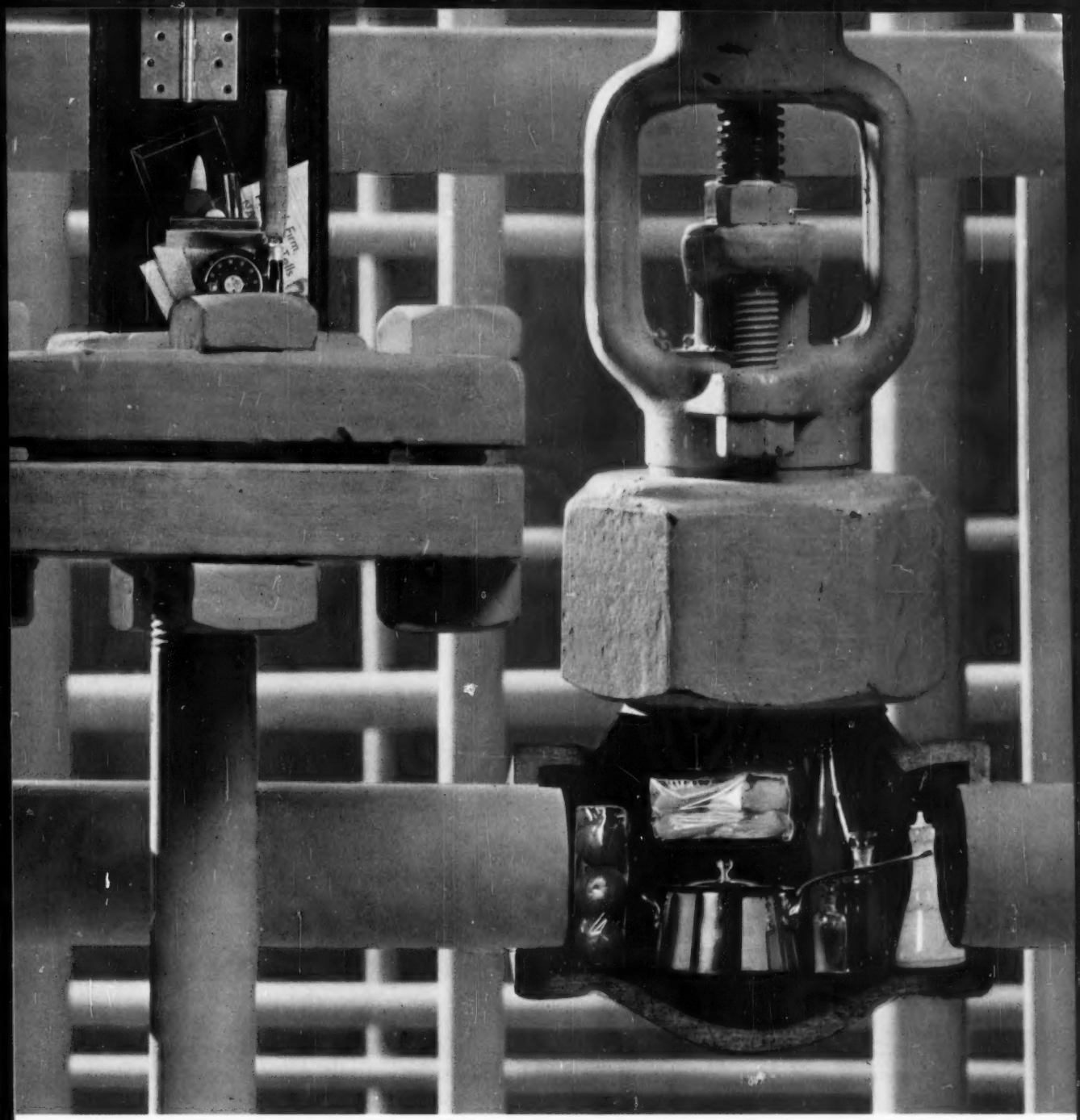
HERCULES POWDER COMPANY
INCORPORATED
900 Market Street, Wilmington 99, Delaware

CHEMICAL MATERIALS FOR INDUSTRY

Q59-7



FOR HELPFUL IDEAS ON THE CHEMICALS
THAT GO INTO YOUR PRODUCTS,
YOU'LL LIKE DOING BUSINESS WITH
COLUMBIA-SOUTHERN



You can count on smooth production when you use Columbia-Southern chemicals, because they'll be delivered to you on time, in the grades and quantities ordered. You'll find the quality consistently high, too.

But you get far more than prompt delivery and consistent quality when you work with Columbia-Southern. You can call on Columbia-Southern's solid experience in chlorine, alkalies, and related chemicals to help you improve the efficiency of your processing activities. Your Columbia-Southern Representative will give you sound, profit-building advice on such vital matters as forms and grades, transportation economics, storage methods, safety precautions, and applications.

Why not start with a general survey of your current purchases? Call in your local Columbia-Southern Representative and let him work with you in evaluating every step. You'll be glad you did.

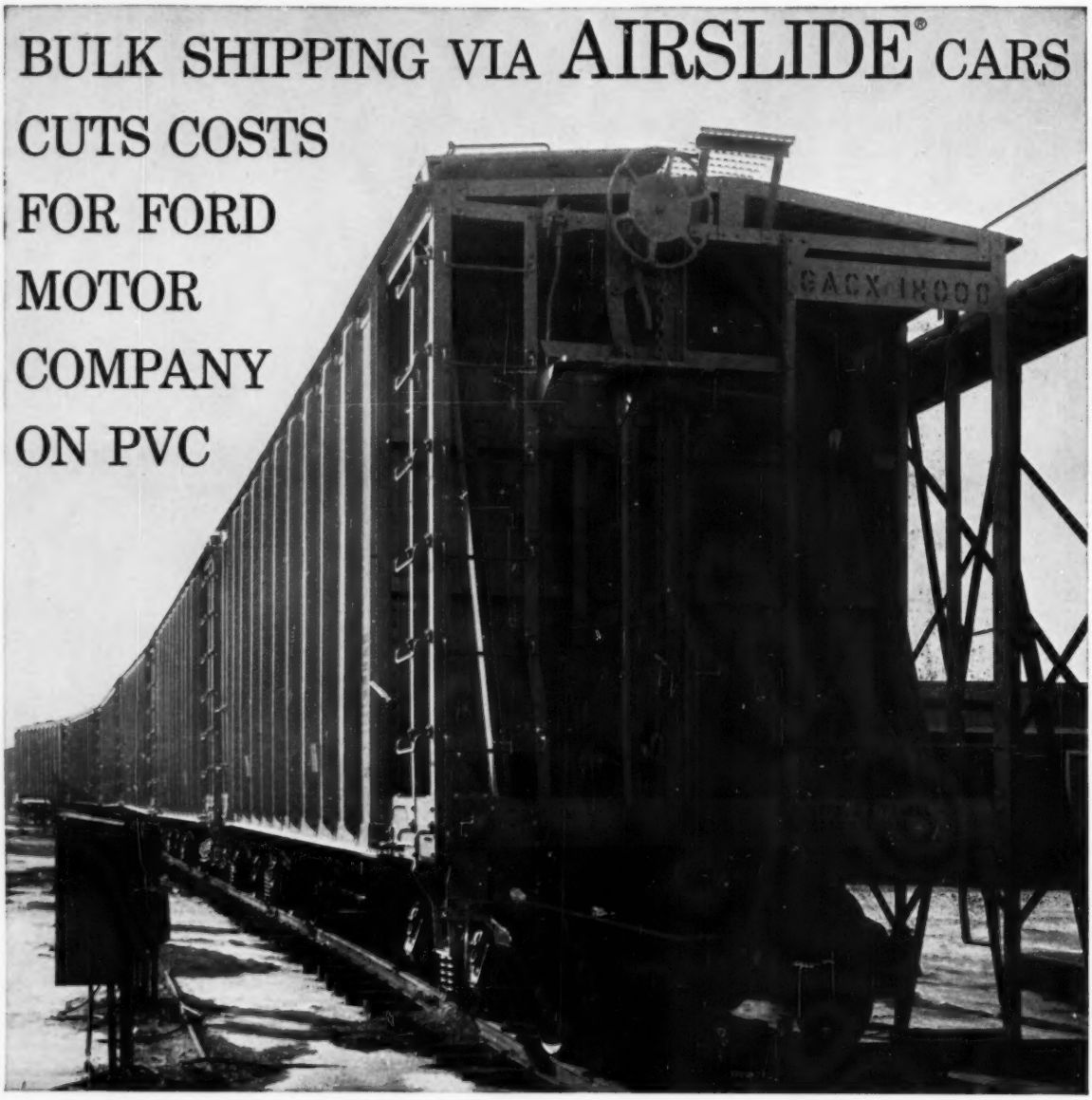
Columbia-Southern Chemical Corporation, One Gateway Center, Pittsburgh 22, Pa. Offices in fourteen principal cities. In Canada: Standard Chemical Limited.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company

Chlorine • Caustic Soda • Caustic Potash • Soda Ash • Sodium Bicarbonate • Solvents • Ammonia
Chromium Chemicals • Barium Chemicals • Sulfur Chemicals • Agricultural Chemicals • Reinforcing Pigments
Calcium Chloride • Muriatic Acid • Calcium Hypochlorite • Hydrogen Peroxide • Titanium Tetrachloride

BULK SHIPPING VIA AIRSLIDE® CARS CUTS COSTS FOR FORD MOTOR COMPANY ON PVC



Producing a better car for the least possible money is a constant challenge to auto manufacturers. To help solve this problem the Ford Motor Company is cutting costs of transporting PVC resin by bulk shipping in Airslide cars.

As a result, Ford not only gets substantial savings, but receives the PVC without in-transit contamination.

The Airslide car is filled by blowing the resin through one of the top hatches of the car. At the unloading point, low pressure air is used to aerate the PVC and cause it to discharge by gravity. The product is then taken under vacuum through a pipe to storage bins.

If you ship or receive dry granular chemicals in bulk, investigate the advantages of shipping via Airslide car. You'll find *it pays to plan with General American.*

Airslide and Dry-Flo Car Division
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South LaSalle Street · Chicago 3, Illinois
In Canada: Canadian General Transit Co., Ltd., Montreal

AIRSLIDE GENERAL AMERICAN TRADE MARK

Management's New Militancy

Stiffer Labor Bargaining Brings Varied Results in Six Cases

Case	Action Sought by Management	Outcome
1. Steel Industry (nine companies)	Changes in work rules, "non-inflationary wage increases"	Not settled
2. American Oil Co. (Texas City, Tex., refinery)	Changes in work rules	Not settled
3. American Oil Co. (El Dorado, Ark., refinery)	Job classification changes	Settled along lines proposed by company
4. Great Lakes Carbon (Morganton, N. C.)	Minimum work quotas, elimination of union dues checkoff	Settled along lines proposed by company
5. Union Carbide Metals (three locations)	Elimination of escalator clause, and multiplant bargaining	Settled along lines proposed by company
6. Virginia-Carolina (Florida phosphate fields)	Separate contracts for separate facilities, change in union dues checkoff system	Strikers back at work with wage increase, no contracts yet negotiated

Hard-Bargaining CPI Takes Cue from Steel

Cast in bold relief by the steel strike is the question of how well industrial management's increased militancy in labor relations has paid off in '59. Now, as pressure mounts for settlement of the strike before the court-imposed injunction runs out, chemical process industries management is watching for indications of what the steel industry's long holdout may produce.

CPI management itself has also shown a marked—but not unexpected—degree of firmness on labor issues. The table (*above*) lists a few examples of chemical management's significant stands, or where its determined bargaining produced unlooked-for results. Other efforts, though they didn't create as much public splash, also made themselves felt.

Steel Precedent: Because of its character and duration, the steel strike will have a marked effect on labor negotiations in most industries. Moreover, the steel strike now symbolizes the current state of labor-management relations to managers, legislators and the public alike.

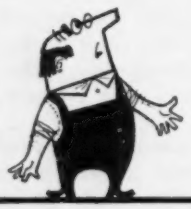
Central to the steel case is the issue of work rules and automation. Certainly other issues, such as the personal prestige of steelworkers' President David MacDonald, and the problem of inflation, have played their part. But these are side issues. What the steel industry is after—and this is equally true in the CPI—is to regain operating prerogatives that became heavily encrusted with negotiable contract obligations during the postwar rush to resume civilian production at any expense.

So far, the steel strike has produced no results heartening to either management or labor. Both sides have incurred tremendous expenses, or losses. Both have received wide publicity, some of it deprecatory. And although both sides, near the strike's beginning, had their share of sympathizers, much commentary in the recent past reflects some evidence of public distaste.

Apparently, management and union have made some progress on the work-rule problem over the five-

Distillation Products Industries seeks inquiries from companies with production problems involving the manufacture of compounds not generally available in the quantity or purity required. We are equipped for and experienced in synthesis on a custom basis. This service is offered for quantities in the larger-than-laboratory-but-less-than-tankcar range. Please address *Distillation Products Industries,* Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).

DPi



month period. Both seem to be agreed that the problem can be worked out in committees set up under a new contract. Crux of the matter is how to settle points that the joint labor-management committee cannot reach agreement on. The industry wants them submitted to arbitration; the union thinks they can be worked out in the joint committees.

National Policy: The threat of prolongation of the steel strike has started mutterings in many places. In just the past few weeks, a number of legislators have called for new laws that would give the government greater power to deal with strikes, prevent production stoppages before they can dangerously affect wide segments of U.S. industry.

Against this backdrop, and the expectation of lengthy strikes in the electrical and railroad industries, CPI management has been measuring results of its own stiffer postures.

Longest Strike: Most notable instance of management's stiffening has been at American Oil Co.'s plants at Texas City, Tex., and El Dorado, Ark., where workers struck more than four months ago. At both, management has sought to change work rules so that workers could be reclassified, then reassigned jobs.

At El Dorado, a company proposal including means of solving this problem has been accepted, and employees are back at work. But at Texas City, workers are still out—the longest refinery strike yet recorded on the Texas Gulf Coast. Both strikes are estimated to have incurred costs in the six-figure category. How the settlement at El Dorado will affect the plant's earnings has yet to be measured.

Both strikes have been characterized by displays of management determination, including such seldom-used tactics as sending out letters of ultimatum to employees, telling them to return to work or be replaced.

Another determined position—and issuance of a sort of ultimatum—was taken by Great Lakes Carbon at Morganton, N.C. It set up a hiring office to replace workers striking against its plan to establish minimum work quotas in an electrode department and to eliminate the union dues checkoff. Great Lakes' stand apparently paid off. The strike was settled along lines the company proposed. But the firm faced wide bitterness and violence in achieving its goal.

In Florida's phosphate fields, the stand of Virginia-Carolina (seeking to separate rock-mining from its triple superphosphate operations) produced a long and bitter strike, characterized by violence. V-C has not yet negotiated a contract, although the plant is back in operation following a vote by union members to stop the strike. The company has given two wage increases amounting to 11¢/hour—following patterns of other settlements in the area.

One of the most significant settlements favorable to management—and accomplished apparently with a minimum of publicity and bitterness—was Union Carbide's agreement a few weeks ago with steelworkers at its Metals Co. plants in Ashtabula, O., Portland, Ore., and Sheffield, Ala. The new contracts call for dropping the cost-of-living escalator clauses—though they "lock in" increases accumulated up to the date of the agreement—and no increase in supplemental unemployment benefits. Two of the contracts are for two years; the third, for three years.

Where It Leads: How these determined stands—and others—will pay off can't be entirely assessed now. Unquestionably, management thinks its operating efficiencies will be improved by regaining work-rule prerogatives. On the other hand, unions look bitterly on the loss of negotiable points they feel have been their most important gains over the past decade, and they aren't taking the loss lightly.

Both of the major unions in the chemical industry, Oil, Chemical & Atomic Workers Union and the International Chemical Workers Union, took unprecedented steps at their annual conventions last October. They revamped their organizing programs to gain members and improve union finances.

Both unions have issued their perennial calls—this year backed up by the organizing action—for greater militancy. And, on the federation level, the AFL-CIO's Industrial Union Dept., convening last month in Washington, called management militancy its outstanding current problem. Such attitudes are harbingers of still-broad-

Progress Report...

—New pharmaceutical chemicals

—Ethanol

New chemicals for improved pharmaceuticals

New chemicals from CARBIDE are finding many uses in the pharmaceutical industry. New low-cost solvents have lowered operating costs, and new intermediates are available for drugs.

Primary amyl acetate is an extraction solvent. Its solubility in water is less than 0.2 per cent by weight; it has a narrow boiling range near 150°C.; its vapor pressure at 20°C. is only 3.8 mm.; and the CARBIDE product is nearly 100 per cent in amyl ester content. These properties mean lower volatility losses, reduced losses into the aqueous phase, more efficient extraction, improved solvent recovery, and higher yields. Equipment corrosion problems are lessened because CARBIDE's primary amyl acetate contains no halides. It is used as a penicillin extractant; and shows promise for use with other antibiotics and steroids.

Primary amyl alcohol is a solvent which, like primary amyl acetate, has a high boiling point, low solubility in water, and is a pure mixture of primary C_5 alcohols. Primary amyl alcohol is used as a purification, recrystallization and extraction solvent.

Propionic acid, produced by CARBIDE from propionaldehyde, is a quality intermediate for drugs, hormones, and fungicides: It is used in the synthesis of propionylsalicylic acid, an antirheumatic, propionyl phenetidine (triphenin), an antipyretic, and diethylstilbestrol dipropionate, a synthetic estrogen. The zinc salt of propionic acid is an effective fungicide.

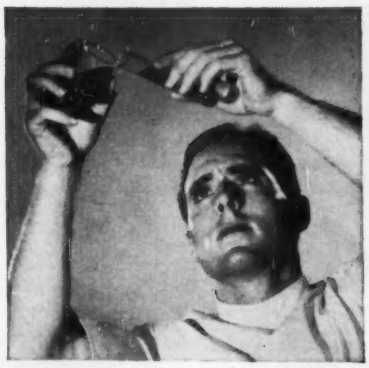
2-Methyl pentaldehyde, a derivative of propionaldehyde, is an intermediate for meprobamate, one of the important tranquilizing drugs.

Propionaldehyde is an intermediate for Tetronal soporific; and *propionic anhydride* is used as an intermediate for propiophenone, propionates, and related drug intermediates.

Butyric acid is an intermediate for the preparation of anti-thyroid drugs and bronchial antispasmodics.

Isobutyraldehyde is a CARBIDE product used in preparing pantolactone, pantothenic acid, and calcium pantothenate.

These are some of the pharmaceutical uses for CARBIDE's new products. Each is characterized by high purity, assured through careful quality control and rigid specifications.



Other new chemical intermediates available in research and development quantities . . . .

- Pentanol-1 (98% + straight-chain, primary alcohol)
- 2-Methyl -1- butanol, Commercial
- Valeric acid
- 2-Methyl pentanoic acid
- *iso*-Pentanoic acid (mixed isomers)
- *iso*-Decanoic acid (mixed isomers)
- *iso*-Pentaldehyde (mixed isomers)
- Valeraldehyde
- 2-Methyl -1- pentanol
- *iso*-Decaldehyde (mixed isomers)
- 2,2,4-Trimethyl -1- pentanol
- 2,2-Dimethyl-1,3-propanediol (neopentyl glycol)
- 2-Methyl-2-ethyl-1,3-propanediol
- 2,2,4-Trimethyl-1,3-pentanediol
- 2,2-Dimethyl-1,3-butanediol
- Ethyl-3-formyl-propionate
- Ethyl-4-formyl butyrate
- Ethyl formyl-2,5-endomethylene cyclohexane carboxylate
- Ethyl formyl cyclohexane carboxylate

Ubiquitous ethanol . . .

CARBIDE's ethanol is tailored in a variety of grades to suit many industrial requirements. It may be either anhydrous or 190 proof, specially or completely denatured; as SYNASOL solvent or ANHYDROL gasoline-free solvent.

As a solvent, ethanol is valuable in the manufacture of lacquers, enamels, varnishes, and stains. It is used in the compounding of nitrocellulose, cordite, and smokeless powder.

Ethanol is a raw material in the formulation of ethyl esters and chloroform. Its oxidation to acetaldehyde leads to many organic chemicals of higher molecular weight through aldol condensation.

SYNASOL solvent is CARBIDE's formulation of ethanol with gasoline and other denaturants to produce a mixture widely used as a shellac thinner and ink solvent, as a coupler in nitrocellulose lacquers, and for other purposes.

ANHYDROL solvent, containing no gasoline, is used in the manufacture of printing inks, textile dyestuffs, solutions, synthetic detergents, aircraft deicing fluids, and other products.

Profitable information about ethanol and CARBIDE's proprietary solvents is presented in the 80-page booklet, "Alcohols." For a copy check the box.

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. HW, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

☐ Alcohols booklet.

☐ 1960 Physical Properties of Synthetic Organic Chemicals—a comprehensive description of the properties and applications of more than 400 CARBIDE chemicals.

Name_____

Company_____

Position_____

Street_____

City_____ Zone_____

State_____

And remember, there is a CARBIDE sales office near you where you can obtain the services of a CARBIDE Technical Representative.

ANHYDROL, SYNASOL, and UNION CARBIDE are registered trade marks of Union Carbide Corporation.

UNION CARBIDE CHEMICALS COMPANY

DIVISION OF

UNION CARBIDE

CORPORATION

IMPORTANT CUSTOMERS REPEAT WITH D-K-A

Davidson-Kennedy Associates Company is now executing its *ninth* contract for a company which awarded D-K-A its first assignment in July, 1957. This is one of many nationally known firms which repeatedly look to D-K-A for *Realistic Project Evaluations, High Quality Engineering and Construction, Prompt Completions* and *Complete Turnkey Service.*

When you select an engineer-contractor, profit by the experience of others. Repeat business by satisfied clients is evidence that it will be to your advantage to consult with Davidson-Kennedy Associates on plans for expansion and modernization.

Davidson-Kennedy Associates Company

2719 Chicago Road, Chicago Heights, Illinois
1090 Jefferson Street, N.W., Atlanta 18, Georgia

PROCESS DESIGNERS & BUILDERS
Studies • Engineering • Procurement • Construction

er reaction to management's increasingly rigid outlook.

Some observers see chemical management's increased militancy as part of an even larger picture. They feel that the industry is one of the first to move into the complex area of automation and its effects on company and labor.

In the observers' view, the CPI is pioneering a new industrial relations frontier, feeling out obstacles, learning and developing techniques. If this is so, and the industries maintain a high order of capital accretion and modernization, it can be expected that automation problems and their attendant labor problems may go on for a long time to come.

At any rate, long haul or short, there are numerous signs that management's efforts to regain prerogatives it believes it has lost will continue. In the context of prosperous expectations for the next several years, labor relations in the CPI may produce new and challenging patterns.

LABOR

Stauffer Back: The strike by three unions at Stauffer Chemical Co.'s hydrochloric acid plant near Louisville, Ky., has ended with new contracts for locals of International Chemical Workers Union, Plumbers and Pipefitters, and International Assn. of Machinists. Settlement with the pipefitters, in a three-year pact, includes wage hikes of 11¢/hour during the first four months of the first year, 2¢ additional in the next two months and 5¢ more in the next six months. The second year of the contract calls for an 8¢/hour increase, and 7¢ more the final year.

The machinists and ICWU agreed with an 11¢/hour increase, effective on signing the contract; 7¢ more in May '60, an 8¢ hike in Nov. '60, and 7¢ additional in Nov. '61.

•

Cutter Suit: Cutter Laboratories (Berkeley, Calif.) has filed a $63,946 damage suit in federal district court in San Francisco against International Longshoremen's Union, Local 6, for damages resulting from an alleged secondary boycott. Cutter claims ILWU longshoremen refused to move $13,946 worth of perishable drugs from a dock to a refrigerator ship,

We can serve you *better* because we have *more to serve you with!*

National produces a greater volume of a longer line of dibasic acids and anhydrides, cycloaliphatic solvents and diisocyanates than any other supplier of resin chemicals! Multi-plant production assures continuity of supply.

Get our specifications, technical data and prices on the products listed here.

MALEIC ANHYDRIDE

Tablets, Rods or Molten

Comprehensive 58-page Technical Manual on Maleic Anhydride and 12-page booklet on Molten Maleic Anhydride available.

FUMARIC ACID

99.6% pure and free-flowing. Absence of color makes it extremely desirable for resins and plasticizers.

PHTHALIC ANHYDRIDE

Molten and Flakes

Mixed car and truckloads offered with Maleic Anhydride, Adipic and Fumaric Acid and other National Resin Chemicals.

NADONE® – Cyclohexanone

Fully integrated production. Minimum purity 99.7%. Excellent solvent and intermediate for high-quality, light-colored resins. Technical Bulletin I-19 available on request.

ADIPIC ACID

99.8% minimum purity. Light in color, low in iron. Ask for Technical Bulletin I-12R.

NAXOL® – Cyclohexanol

Two types immediately available: NAXOL (100% material) and NAXOL D (freezing point depressed). Write for Technical Bulletin I-20.

Samples and Data Also Available on:

Aniline • ε-Caprolactam • Hexahydro Phthalic Anhydride
Tetrahydro Phthalic Anhydride • Meta-Phenylenediamine
Succinic Acid • Succinic Anhydride • Nadic® Anhydride
Malic Acid • Dodecenylsuccinic Anhydride
Nadic® Methyl Anhydride

plus a comprehensive line of
NATIONAL PLASTIC AND RESIN COLORANTS

And for URETHANES . . .

NACCONATE® – Diisocyanates

NACCONATE 80
Isomeric mixture of approximately 80% of 2,4-tolylene diisocyanate and 20% of 2,6-tolylene diisocyanate.

NACCONATE 100
2,4-tolylene diisocyanate.

NACCONATE 65
Isomeric mixture of approximately 65% of 2,4-tolylene diisocyanate and 35% of 2,6-tolylene diisocyanate.

NACCONATE 300
Diphenylmethane 4,4'-diisocyanate (MDI)

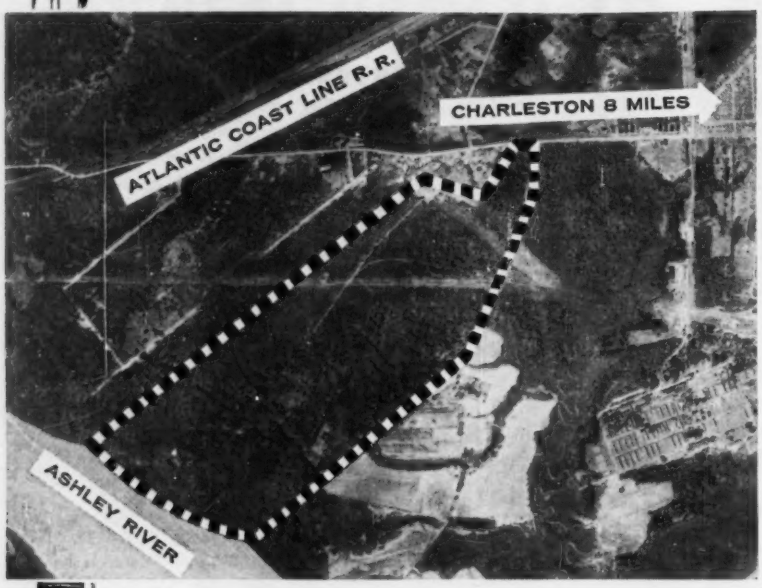
Allied Chemical

NATIONAL ANILINE DIVISION
40 Rector Street, New York 6, N. Y.

Atlanta Boston Charlotte Chicago Greensboro Los Angeles
Philadelphia Portland, Ore. Providence San Francisco

In Canada: ALLIED CHEMICAL CANADA, LTD., 100 North Queen St., Toronto 14

WATER?

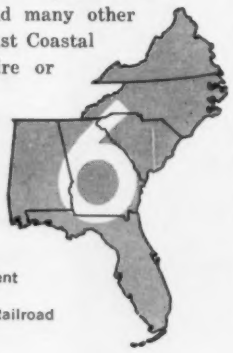


YES! Here's a "site" of it for your chemical plant in the Southeast Coastal 6!

Abundant water! It's yours at this 345-acre river site (over 2000 feet of waterfront) just above the Port of Charleston, S.C. — ideal distribution point to profit markets north, south, and abroad.

Rapid inland transportation via Coast Line and other railroads; quick access to major highways; only three miles from a four-airline airport. All this plus ready sources of power and natural gas, an abundant ready-to-work labor force, congenial climate, friendly people, excellent living and recreational facilities make this a "must investigate" site for most any expanding chemical company.

Check Coast Line's industrial development specialists for details. The complete story on this and many other deep water sites in the growing Southeast Coastal 6 is yours for the asking. Write, wire or phone today. All inquiries held in confidence.



ATLANTIC COAST LINE RAILROAD

Direct inquiries to:

R. P. JOBB
Assistant Vice-President
Department K-129
Atlantic Coast Line Railroad
Wilmington, N. C.

ADMINISTRATION

and that the drugs were subsequently rendered unsalable and had to be destroyed. Cutter seeks $50,000 to cover loss of goodwill from customers it claims were disappointed as a result of the incident.

LEGAL

Carolina 'Fair Trade': Two companies are involved in "fair trade" problems in North Carolina this week.

Union Carbide Corp. is bringing action against a Winston-Salem merchant for selling its Prestone antifreeze at cut rates. A temporary restraining injunction has been issued against the merchant, who must show why it shouldn't be continued.

Gulf Oil Corp. argues that a $101,150 suit brought against it by a Troy service station operator should be dismissed because the operator lacked proper cause to file action. Gulf had obtained a temporary injunction against the operator to prevent his selling its trademarked gasoline at prices lower than those set by the company. The operator contends that Gulf acted improperly and had other means than injunction to prevent his selling the product.

KEY CHANGES

Macauley Whiting to board of directors, Dow Chemical Co. (Midland, Mich.).

Neil H. McElroy to chairman of the board and **R. R. Deupree** to honorary chairman, The Procter & Gamble Co. (Cincinnati).

Paul G. Carpenter to executive vice-president and general manager, Copolymer Rubber & Chemical Corp. (Baton Rouge, La.).

William S. Thornhill to executive vice-president, **Howard T. Cusic** to vice-president, **Paul Klinkowski** to secretary and treasurer, U.S. Polymeric Chemicals, Inc. (Stamford, Conn.).

X. T. Stoddard to vice-president and technical director, Texas International Sulphur Co. (Dallas).

F. K. Weyerhaeuser to chairman of the board and **Norton Clapp** to president, Weyerhaeuser Co. (Tacoma, Wash.).

INDUSTRY'S LARGEST AND MOST MODERN POLYVINYL ALCOHOL PLANT, ON STREAM EARLY IN 1960

VINOL POLYVINYL ALCOHOL

From Airco's 20 million-pound-per-year plant at Calvert City . . . • VINOL in nine grades, each tailored to meet your needs for processing and formulation • VINOL for coatings . . . binders . . . sizing . . . textiles . . . paper . . . emulsions . . . available through Air Reduction Chemical Company. • VINOL for adhesives . . . available through *Colton Chemical Company,* Division of Air Reduction Company, Inc., 1747 Chester Avenue, Cleveland, Ohio. • For technical information on VINOL, write today.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

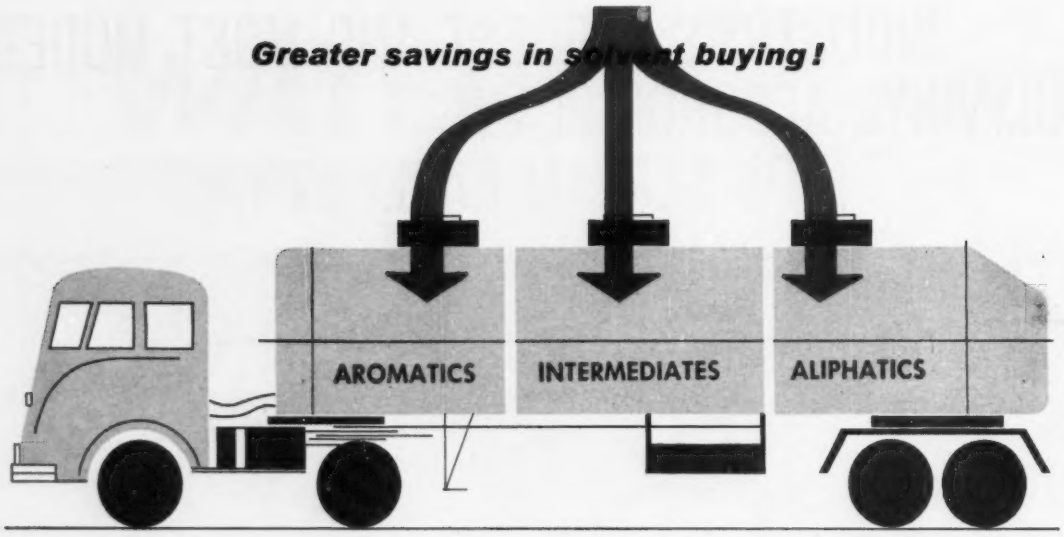
AIRCO®

AIR REDUCTION CHEMICAL COMPANY

A division of Air Reduction Company, Incorporated

150 East 42nd Street, New York 17, N. Y.

Represented Internationally by Airco Company International



ESPESOL SOLVENTS

ONE-SOURCE SUPPLY!

Buy all your solvents at one place . . . at one time!

• **Save on Freight Costs** Smaller, multi-product orders are shipped in compartment lots by tank car, transport truck, barge and ship and enjoy bulk rates.

• **Reduce Inventory Costs** Less capital tied up in inventory because stock on hand is kept to minimum. Losses from evaporation and other causes greatly reduced. Fresh stock insured at all times.

• **"Package" Delivery Ideal for Small Buyers** Combining small lots into one shipment reduces purchasing agent's work, simplifies unloading and handling, and insures all products arriving at one time to minimize production delays.

• **Immediate Availability** Eastern States' conveniently located terminals insure quick delivery to all points.

Eastern States Petroleum and Chemical Company

A Division of Signal Oil and Gas Company

Eastern States Petroleum and Chemical Company
P. O. Box 5008
Houston 12, Texas
CW-121959
Please send additional information on Espesol's ONE SOURCE SUPPLY!

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

Post Office Box 5008—Houston 12, Texas—Phone WAlnut 3-1651
New York Office: 10 Rockefeller Plaza, New York, Phone Circle 7-2520
Chicago Office: 1011 Lake St., Oak Park, Illinois, Phone VIllage 8-5410
Cleveland Office: 20800 Center Ridge Rd., Cleveland, Ohio, Phone EDison 3-0188
Louisville Office: 4th and Broadway St., Louisville, Ky., Phone JUniper 3-7634
Atlanta Office: 3121 Maple Drive, N.E., Phone CEdar 3-3227
Los Angeles Office: 110 S. Euclid, Pasadena, Phone MUrray 1-0278

U. S. Terminals:
Houston, Texas • Chicago, Illinois • East Liverpool, Ohio
Madison, Indiana • Brownsville, Texas • Savannah, Georgia
Carteret, New Jersey • Los Angeles, California

European Terminals:
Dordrecht (Rotterdam) Netherlands
Livorno (Leghorn), Italy

Technology
Newsletter

CHEMICAL WEEK
December 19, 1959

A large variable-thrust liquid-fuel rocket engine has been developed by Aerojet-General (Sacramento, Calif.). Unlike present missile rocket engines, the new engine can be "throttled" up, down or off—over the 50,000-150,000-lb. range—while in flight, a prime requisite for manned space ventures. Dubbed the XLR-113-AJ-1, it uses a "hydrazine-based fuel and a nitric acid-derived oxidizer," says Aerojet, both of which can be stored without costly handling or refrigeration.

"Some redesigning" of its new engine prior to flight will be necessary, according to Aerojet, to make it lighter and provide additional cooling. So far, the firm has no contracts to produce the engine.

Thiokol's Reaction Motors Division has also produced a liquid-fuel, variable-thrust engine—the liquid oxygen-ammonia power plant of the X-15 hypersonic research plane, which can vary its thrust in flight between 25,000 and 50,000 lbs.

•

Water desalting by a freezing process is scheduled for large-scale commercialization soon. Fairbanks, Morse & Co. (Chicago) has been signed by Israel's Ministry of Development to design and build plants using the Alexander Zarchin process (*CW, Jan. 17, p. 39*). Zarchin's process, piloted under tight security for over two years by the Israeli government, is claimed to be efficient. F-M predicts fresh-water cost of 40¢ or less per 1,000 gal. in optimum large-scale production.

F-M plans to start construction of a 500,000-gal./day unit in Israel in '60; to follow with a plant for the U.S. Southwest; and to have a worldwide installed capacity of 1 billion gal./day by the end of '65. Firm plans for achieving the latter two goals have not been worked out. One probable difficulty: opposition from the water-needing, but Israel-hating, Arab bloc nations.

Zarchin has patents in several countries, including the U.S. (2,821,304), but claims to have made undisclosed improvements essential to economical operation. The patents cover a system similar to that being tested by Carrier Corp. (Syracuse, N.Y.) in a 15,000-gal./day pilot unit financed by the Interior Dept.'s Office of Saline Water. Process: vacuum-vaporization of part of the raw water to cool the remainder, producing salt-free ice crystals that are separated, washed and melted to give the fresh water.

Carrier's pilot plant is due to be moved to a coastal location (probably Harbor Island, N.C.) next April or May for further testing. With the new vote of confidence in Zarchin's method, a freezing process seems to be a near-certainty for OSW's East Coast unit, the agency's fifth demonstrator.

•

Rayonier is switching to a new sodium-sulfite pulping process; it will spend $7.5 million on conversion of its existing ammonium-sulfite

pulping facilities at Hoquiam, Wash. Twofold goal: increased recovery of pulping chemicals (up to 85% can be reclaimed for reuse); improved pollution control resulting from reduced BOD of effluents.

Chemical recovery involves neutralizing spent sulfite pulping liquor with sodium carbonate or hydroxide, concentrating it by multiple-effect evaporation and burning it in a steam boiler. Waste wood extracts are consumed to provide by-product heat; sodium carbonate and sulfide are precipitated in a heavy smelt, which is then blown with carbon dioxode to convert all of the sodium into carbonate. By-product hydrogen sulfide is burned, yields molten sulfur for recycle to the pulping process.

The changeover is expected to add "a high order of production flexibility," says Rayonier, will also greatly reduce the effluent load on its Rennie Island lagooning system. The settling basins will continue to be used as an added precaution against pollution of the Chehalis River during seasonal low-water levels.

•

Operations research in plant design has been recommended by Stanford Research Institute's Peter Butterfield as a management tool for ensuring maximum profitability. By assessing such key design variables as plant location, processing capacity, distribution patterns and operating versatility, says Butterfield, OR will enable chemical executives to optimize the initial design and to adjust operations as economic conditions or company policies change.

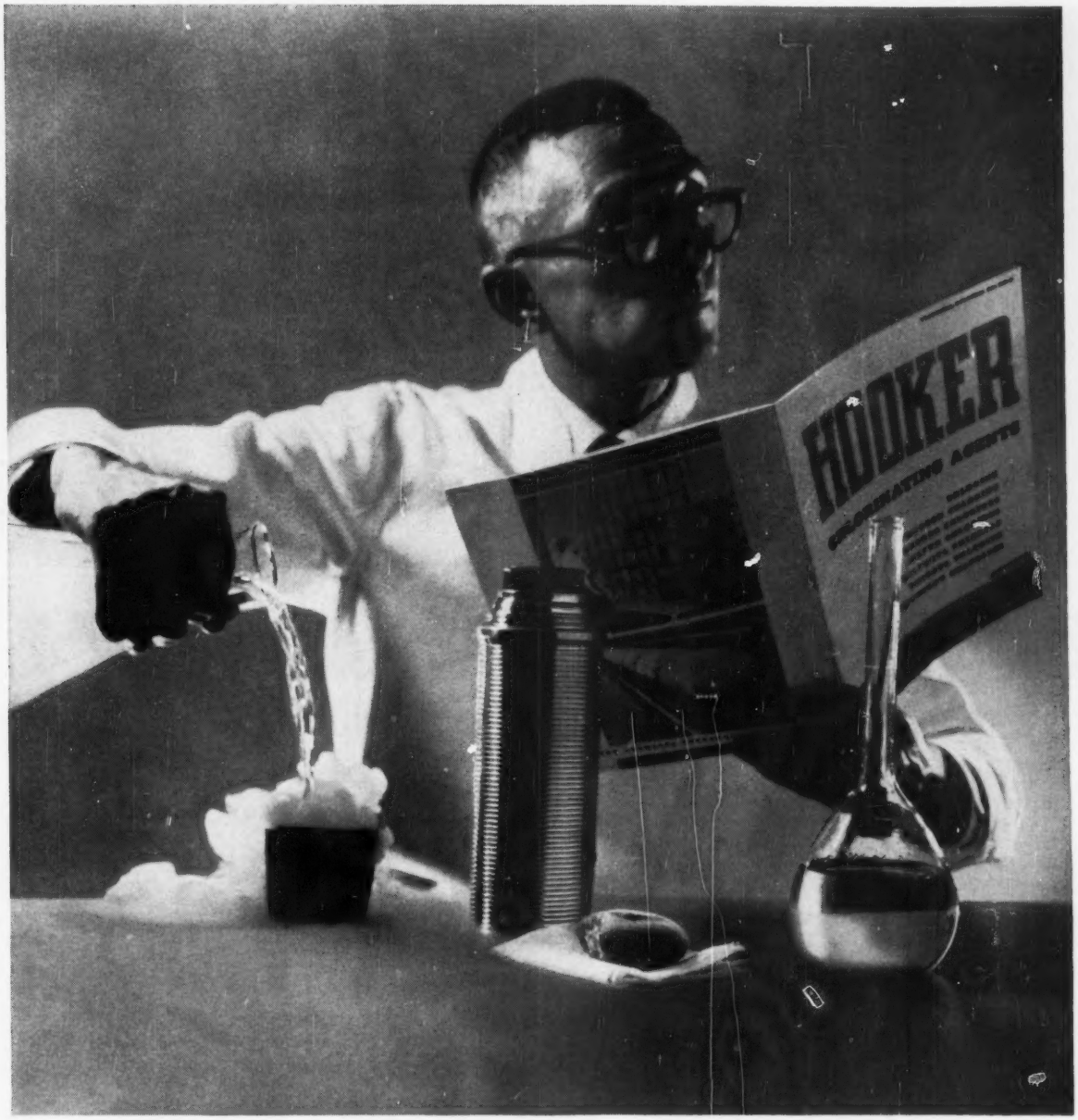
•

Fuel cells may make real inroads into the automotive field in the next decade. Charles Tobias of the University of California made this prediction in a special conference held during last week's American Institute of Chemical Engineers meeting in San Francisco. His reason for optimism: fuel cells are more efficient than reciprocating engines, can be used to power a car to American motorists' satisfaction.

J. A. A. Ketelaar of the University of Amsterdam (Netherlands) added that fuel cells may also find application in central generating stations supplying power for electrochemical industries. Their advantage for this use: output is low-voltage, high-amperage direct current. Long-range outlook indicates that fuel cells are still about 25 years away from general use in domestic power generation, says Tobias, because equipment changeover would be too costly to permit an earlier switch.

•

Potentially profitable pulping by-products now in advanced laboratory stages or early pilot-plant investigation were highlighted at the recent pulp, paper and paperboard industrial waste conference in Chicago by J. M. Holderby of St. Regis Paper Co. Some by-products of special interest: vanillic acid polyester derivatives (the Japanese reportedly have synthetic fibers and resins of this type); syringaldehyde and syringic acid; hydroxybenzoic acid, which could be made in substantial quantities from hard wood; diacetone sugars and polyols from wood carbohydrates.



CHLORINATING? Then you, too, will want to see a copy of our new bulletin, *"Hooker Chlorinating Agents."* It's just off the press.

Thumb through, and you'll find a wealth of information on choosing the right chemical for a given chlorination step. In 24 pages you'll see a summary of key points on using chlorine and Hooker-made derivatives to produce organic compounds.

The new bulletin describes typical reactions with chlorine, hydrogen chloride, phosphorus chlorides, sulfur chlorides, thionyl and sulfuryl chlorides, and antimony chlorides. It saves you time with quick comparison of physical properties; it lists literature references. To get your copy, just use the coupon.

GET THIS NEW BULLETIN: *"Hooker Chlorinating Agents,"* Technical Bulletin 328-B. Free; no obligation. Fill out and mail coupon today.

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

HOOKER CHEMICAL CORPORATION
712-2 Forty-seventh St., Niagara Falls, N. Y.

Sales Offices: Buffalo Chicago
Los Angeles New York Niagara Falls
Philadelphia Tacoma Worcester, Mass.

HOOKER CHEMICALS PLASTICS

In Canada: Hooker Chemicals Limited, North Vancouver, B.C.

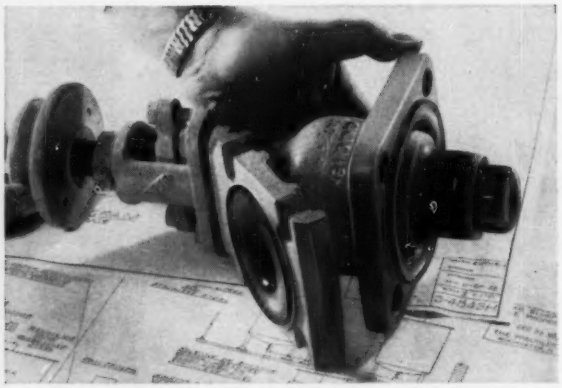
FLUIDICS AT WORK

...developing new products and materials of construction for handling and processing fluids more profitably

Glasteel 59 with 30% more thermal shock resistance

This laboratory test shows iced water hitting 450°F. Glasteel 59. No thermal shock damage resulted. Our process equipment carries a safety factor of three, so Glasteel 59 now gives 150°F. thermal shock protection at a peak operating vessel temperature of 450°F.

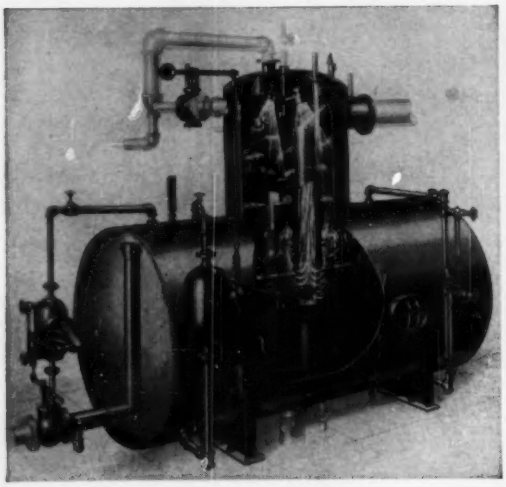
Glasteel 59 also offers excellent acid and alkali resistance. (Bulletin No. 980)



Glassed flush valve

The head and stem on this new valve are *one piece and glassed* . . . eliminating a major cause of valve failure. The rigidized Teflon-glass fiber seat permits firm seating without cracking the head covering.

This glass valve costs no more than conventional valves, with which it can be interchanged. Sizes from 1½ x 1 to 8 x 6 in six different models. (Data Sheet No. 42)

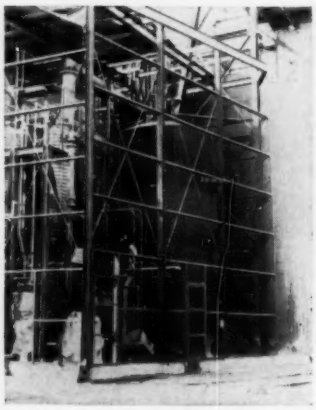


Deaerator that scrubs water to 0.005 ml/l of oxygen

You can process 150,000 lbs/hr of water through this Permutit Type B deaerator and reduce oxygen almost completely.

Type A deaerator handles up to 3,000,000 lbs/hr.

Both are available in either horizontal or vertical designs. (Bulletin No. 2357)



Glasteel chlorine dioxide generators resist all corrosives

Chemicals commonly used in the Solvay or Olin Mathieson processes have no corrosive effects at all on Glasteel generating equipment.

More than 35 pulp and paper mills find it the most economical equipment they can use when all costs are analyzed.

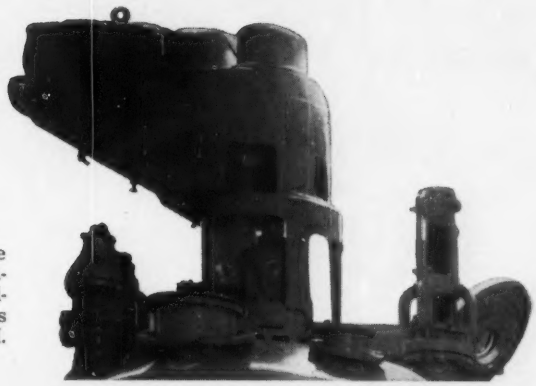
Tantalum bayonet heaters...100% corrosion resistant

Tantalum bayonet heaters are completely corrosion resistant for practically *all* chemical processing applications.

You get heat transfer area up to 15 square feet, depending on tube size and number in cluster. Also available in large production sizes . . . heat exchangers, vessels, and reactors of tantalum—and of titanium and zirconium, too. (Bulletin No. 978)

Agitation drive cuts maintenance up to 50%

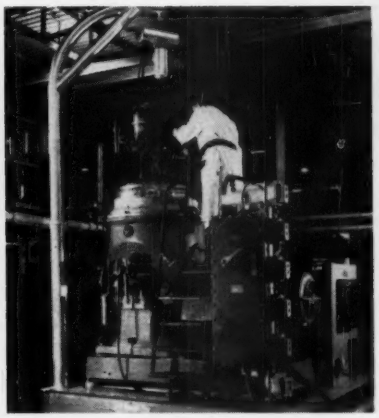
New Pfaudler BH Drive drastically reduces drive maintenance with these features: fast pilot fit alignment every time, longer-lasting shaft and seal, antifriction bearings, Pfaudlerpac fast changeover seals or stuffing boxes. 12, 30, or 60 HP at 100 RPM. (Bulletin No. 972)



Electronic instrument for safe testing of glassed steel

The new PFAUDLERTRON glass tester—completely electronic—gives you a fast, visual signal when testing for exposed metal.

It has stabilized voltage, two probes (brush and needle point), cannot puncture sound glass or cause dielectric breakdown. (Bulletin No. 970)



Packaged centrifuge for in-plant production line testing

Now you can test our Titan centrifuge in your own production line *before you buy.*

All you need is an available 220/440 three-phase electrical service plus water to test our Titan centrifuge in your own production line with this portable unit.

It has 6000 gal/hr capacity and is complete with required pumps, valves, controls and other accessories.

This first of a series of packaged test units is available on a leasing agreement set to meet your particular needs.

We can also provide technical personnel for setting up and operating your test program. (Bulletin No. 946)

Glassed ductile-iron fittings* with strength comparable to Glasteel's

These glassed-ductile iron fittings have strength 2½ to 3 times higher than that of low-strength gray iron.

Like Glasteel, they have high thermal shock and corrosion resistance.

Available now. (Bulletin No. 977)

*Pat. Pending

FLUIDICS covers such varied phases of fluid handling and control as: **corrosioneering • water treatment • waste treatment • reactions • polymerization • ion exchange • fluid analysis • metering and control • agitation • evaporation • distillation • drying • blending • valving • piping • storing • centrifuging • filling • heat transfer**

When you have a fluid-handling problem, try Pfaudler Permutit FLUIDICS program for the best solution.

FLUIDICS AROUND THE WORLD

Pfaudler Permutit is a world-wide company with manufacturing plants in Germany (Pfaudler-Werke A.G.), Great Britain (Enamelled Metal Products Corp. Ltd.), Canada (Ideal Welding Co. Ltd.), Mexico (Arteacero-Pfaudler, S. A.), and Japan (Shinko-Pfaudler Co., Ltd.), in addition to our four plants in the U. S.

Write to Pfaudler Division,Dept. CW-129,Rochester 3, N. Y., for more information about the Fluidics program.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . .
the science of fluid processes

CW PHOTOS—E. RESHOVSKY

Bidder at auction of surplus government plant at Azusa, Calif., gets numbered identification card from registrar Mary Lou Weston as he arrives for sale.

Bidders gather to hear preliminary instructions of auctioneers Sid Levin and Harold Rouse, as sale begins. Auctioneers

Numbered identifications permitted fast spotting of bidders.

Auction Day at a Chemical Plant

At Azusa, Calif., last week more than 200 bidders braved two days of intermittent rains for a chance to purchase, piece by piece, a government surplus chemical plant sold at auction. When it was all over, the successful bidders, spurred by the auctioneers' chain of chatter, had spent about $500,000 for equipment and facilities built during World War II at a cost of $5.5 million and operated only for trial runs by American Cyanamid.

Everything at the war-gas plant was sold at a hectic pace. Auctioneers Harold Rouse and Sid Levin, perched on a mobile auction block that weaved in and out among the 56 buildings on the sprawling 20-acre site, disposed of compressors, condensers, evaporators, pumps—even sewers and a railroad spur. First item on the block, 28 gas masks, sold for 25¢ each; most expensive item, a cooling tower, went for $16,000.

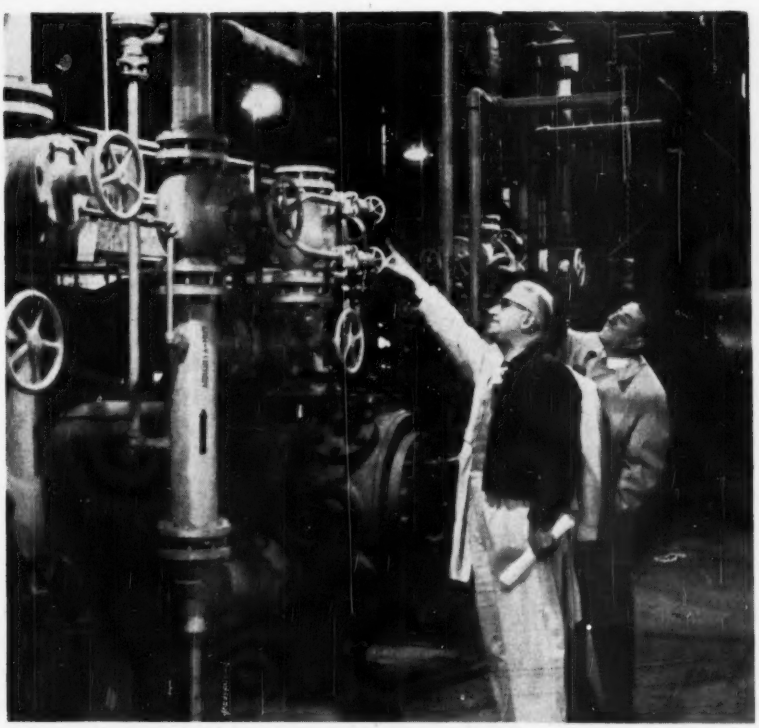
The plant's lead and steel piping, sold by the ton, still must be dismantled and weighed before the price can be computed. Some of the items brought more than the government's original cost. For example, an air compressor originally purchased for $2,000 sold for $4,200. And $6,000 steel tanks, purchased by a New Jersey equipment dealer for $4,200 each, will have cost considerably more than the original price when they have been dismantled and shipped East.

Slim Pickings in Scrap: As at most auctions, the bidders fitted into three main classifications: (1) those wanting to operate the equipment, (2) those wanting to resell it, (3) those wanting to sell the equipment for scrap. But

PRODUCTION

stand is mobile to permit continual auc-tioning throughout the 20-acre plant.

Auctioneer Harold Rouse keeps auction moving at a rapid pace, to hold the interest of the more than 200 bidders who attended.

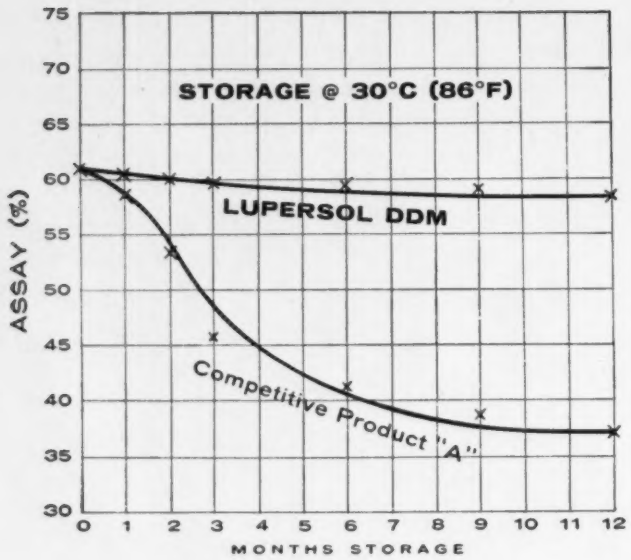


Prospective customers Louis Vitale and Louis Devlin take a last look at ammonia compressor in compressor room before item is sold.

Even the railroad spur—inspected here by scrap dealer Harry Burlin—was sold.

LUPERSOL DDM

60% METHYL ETHYL KETONE PEROXIDE IN DIMETHYL PHTHALATE



LUPERSOL DDM HAS LONG TERM

STABILITY

Storage tests of LUPERSOL DDM show no appreciable loss of assay after 1½ years of storage at ambient temperatures (20-80°F.). LUPERSOL DDM is readily soluble in most synthetic resin monomers and is a convenient non-viscous liquid catalyst for the polymerization of polyester and vinyl type resins. It is useful in developing "room temperature" cures with polyester resins, which require an accelerator such as cobalt naphthenate. Depending on the polyester resin used, the cobalt may already be present or may have to be added separately. The recommendations of the resin supplier should be followed in making up formulations for "room temperature" cures. When catalyzed with LUPERSOL DDM, certain mixed, unsaturated polyesters polymerize to give hard, infusible materials strongly resistant to the usual solvents and highly useful in laminating, coating and impregnating work.

Write for Data Sheet

LUCIDOL DIVISION

WALLACE & TIERNAN INCORPORATED
1740 MILITARY ROAD
BUFFALO 5, NEW YORK

there was little scrap, because potential users and equipment dealers were ready to pay considerably more than the scrap price for most of the equipment. Exceptions: lead-lined condensers, towers and pipe.

When the plant—on stand-by basis since the war—was declared surplus, it was sold for $179,000 to auctioneers Max Rouse & Sons and Elliot Evans. They cataloged the package, broke it up into 719 lots of salable items. Letters announcing the auction, describing in general what was available, were sent out to 20,000 potential purchasers. Then, to 15,000 most-likely buyers who replied to those letters, the auctioneers mailed brochures giving detailed descriptions of the items. Cost of lotting and advertising: $30,000.

Among the bidders: chemical companies, food processors, mining companies, construction contractors, realtors and chicken hatcheries.

Since the items were sold on an as-is basis, the plant was open for inspection for several weeks before the auction. On the auction days, the

The successful bidder on ammonia compressor, Hank Hendler of Gold-

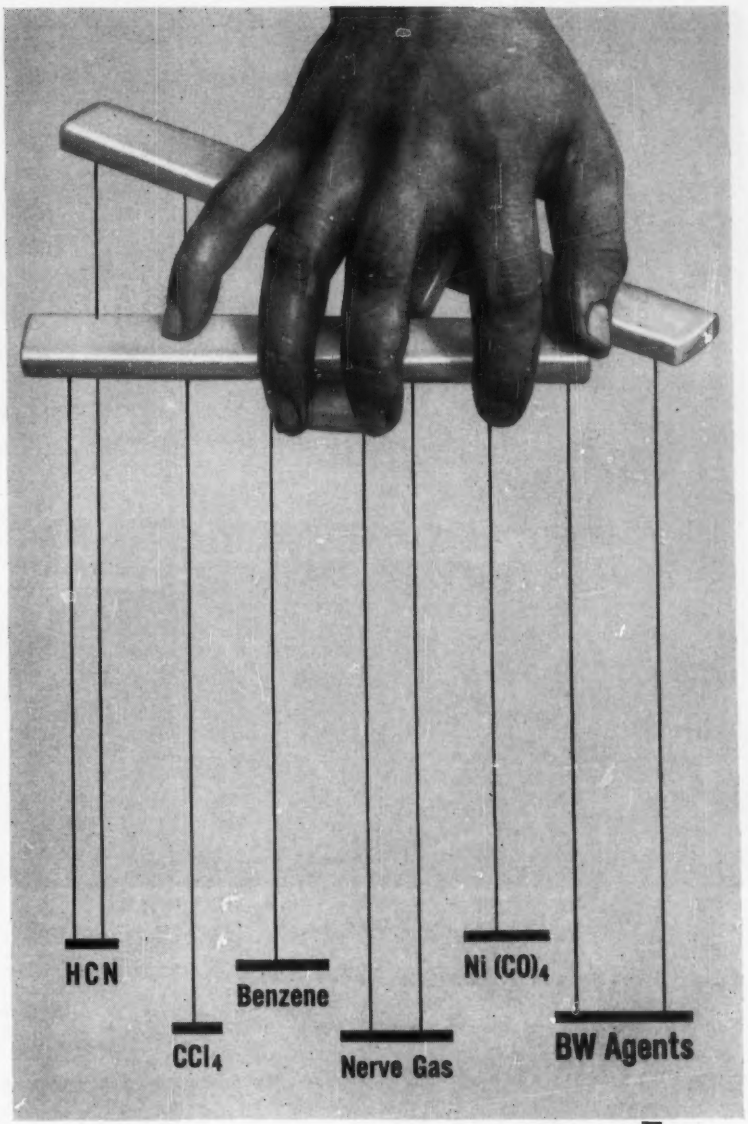
bidders registered and were assigned a number for rapid identification by the auctioneers.

Purchasers deposited 25% of the bid price at the time the bids were accepted, the balance within 48 hours. (A common practice among large-volume buyers: hand the auctioneer a blank, signed check at the beginning of the auction. The auctioneer fills in the total amount at the close of the auction.)

Checking Out: As soon as the last item, a 4,000-sq. ft. office building, was sold, the check-out period began. This period will extend for 30 days, during which time the successful bidders must dismantle and haul away the equipment they have purchased. Appointments for dismantling have been spread out over the month to prevent work crews from getting in each other's way.

Last item to go: the fire-fighting equipment. Once it is gone, only a few scars will remain on the foothills of the Sierra Madre Mountains to mark the site of a chemical plant that had outlived its usefulness.

ring Meat Packing, hands check for deposit on item to clerk Albert Lowy.



tolerance: **none!**

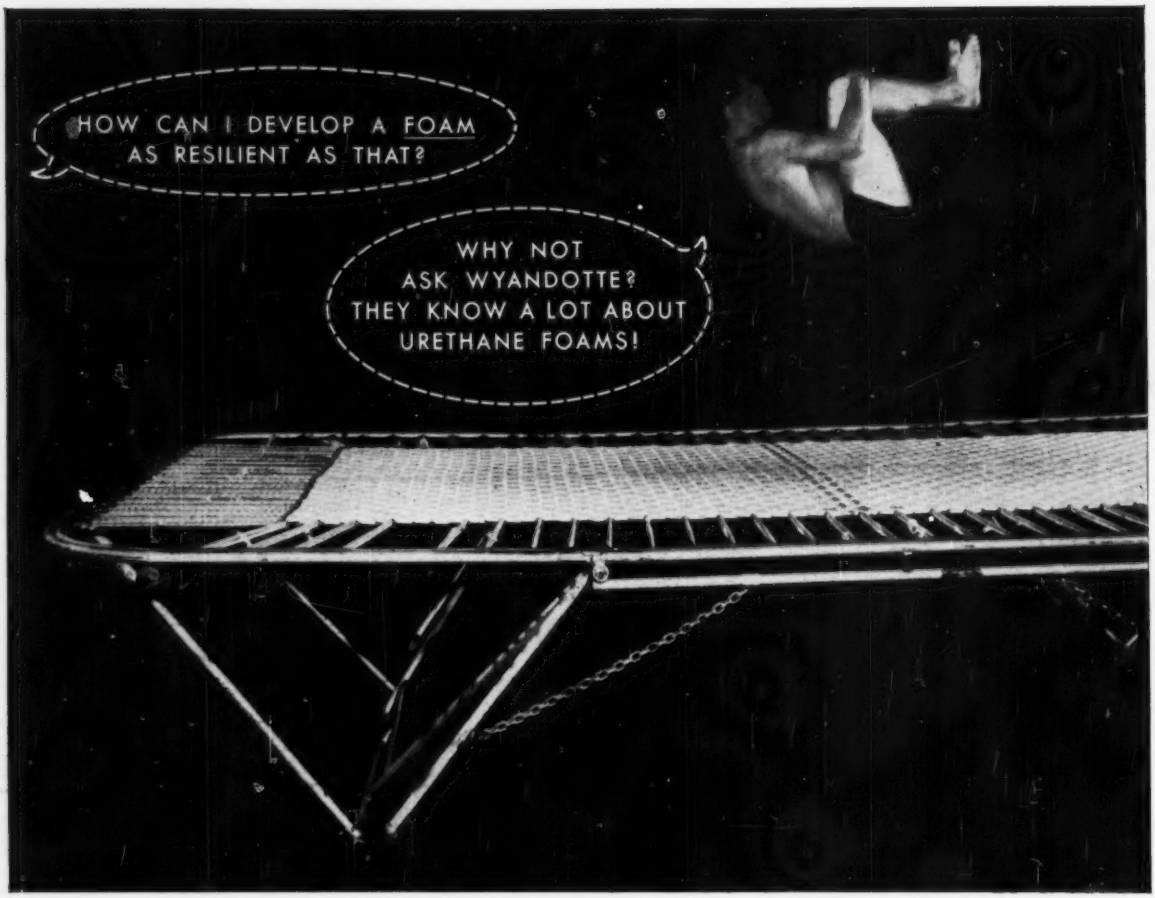
Impossible... not necessarily. Vitro has already built several installations in which even the briefest exposure to ultra-hazardous materials would be instantly fatal. Among these are the U. S. Army Chemical Agents Facilities (nerve gas) at Denver and Muscle Shoals, the Biological Warfare Laboratory at Fort Detrick, and $2 billion worth of atomic facilities—every one of which required extensive know-how in handling radio-active and other dangerous materials.

These skills in crossing scientific frontiers were also applied in designing the complete animal disease research laboratory for the Department of Agriculture. They are the key to providing safe operations under hazardous conditions through the use of advanced techniques.

Put this experience to work for you.

engineering the future—

Vitro ENGINEERING COMPANY
225 PARK AVENUE SOUTH, NEW YORK 3, N. Y.
A DIVISION OF VITRO CORPORATION OF AMERICA



Bounce a question about urethane-foam resilience to Wyandotte . . . and they're pretty sure to spring back with the right answer.

For, as a pioneer in the development of the polyethers that have revolutionized the urethane-foam industry — Wyandotte *does* know a lot about the subject.

Take resilience. Wyandotte's polyethers are permitting increased load-bearing characteristics and lower compression-set values in foams ranging all the way from supple softness up to the point of rigidity.

Wyandotte has the products — and the technical background — to help you get the combination of characteristics you need in urethane foams. If you'll let us know your requirements, we'll furnish samples of appropriate materials, and pertinent data. Write today. *Wyandotte Chemicals Corporation, Dept. 799-W, Wyandotte, Michigan. Offices in principal cities.*

Improve your formulation with Wyandotte's urethane-foam raw materials

PLURONIC® Polyols — A series of related difunctional block-polymers terminating in primary hydroxyl groups possessing increased reactivity in polyurethane formulations.

PLURACOL® P Diols — A series of polypropylene glycols which impart excellent resilience and strength properties to flexible foams.

PLURACOL TP Triols — The lower members of this new series are excellent for the production of rigid foams.

TETRONIC® Polyols — Tetra-functional series of polyethers for improved resilience and moldability.

QUADROL® — A very reactive cross-linking agent and catalyst . . . a solvent for fluorinated hydrocarbons used as blowing agents in foams.

DHP-MP — A chemically reactive amine catalyst with extremely low odor.

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

PACING PROGRESS WITH CREATIVE CHEMISTRY

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • MURIATIC ACID • HYDROGEN • DRY ICE
GLYCOLS • SYNTHETIC DETERGENTS • SODIUM CMC • ETHYLENE OXIDE • ETHYLENE DICHLORIDE • POLYETHYLENE GLYCOL • PROPYLENE OXIDE
PROPYLENE DICHLORIDE • POLYPROPYLENE GLYCOL • DICHLORODIMETHYLHYDANTOIN • CHLORINATED SOLVENTS • OTHER ORGANIC AND INORGANIC CHEMICALS

Market Newsletter

CHEMICAL WEEK
December 19, 1959

Schering Corp. cut the price of antifungal antibiotic griseofulvin (Fulvicin) by 15% last week—coincidental with the appearance of company officials before the Senate antitrust committee's drug price probe in Washington.

Price of the antibiotic—which is made by Glaxo and ICI in England and distributed in the U.S. by Schering, McNeil Labs (Grifulvin) and Ayerst Labs (griseofulvin)—has been cut twice in less than three weeks. New prices to the druggist: $4.33 for bottles of thirty 250-milligram tablets; $13 for 100; $62 for 500 tablets. McNeil and Ayerst have made similar reductions.

The antibiotic price cutting was explained—by spokesmen for both Schering and McNeil—as moves to match competitive prices posted by Ayerst, a newcomer in griseofulvin distribution (Ayerst put ICI's griseofulvin on the market just last week).

•

Are U.S. methylene chloride markets being disrupted by an influx of foreign chloride? Yes, say jobbers, who report that substantial quantities—mostly Italian—started reaching Midwestern consumers about six months ago. They report big-volume users—not drum-a-month buyers—are eyeing foreign material with most interest.

Trade reports from leading jobbers reveal that U.S. suppliers are losing major accounts because foreign methylene chloride is priced 2-3¢/lb. below domestic chloride. They hint that U.S. producers are moving to meet these competitive tabs.

But domestic methylene chloride producers don't agree. They say they can't confirm the reported competition from Italian methylene chloride, express doubts that the chemical is made in Italy. Some say Germany is the big methylene chloride exporter. This does not, of course, rule out the possibility that Italy has begun transhipments of the chemical.

In any case, domestic producers say no price reductions on methylene chloride are now contemplated.

•

Will polypropylene be used for magnetic-tape recording? The film's possibilities for that use are undergoing close scrutiny, and it may become a substantial contender for Mylar's tape markets *(CW, Dec. 12, p. 85)*. Spokesmen in the recording industry say Mylar is now the best tape base for many recording uses, but that polypropylene looks promising because of its cheaper price, good dimensional stability. (Polyethylene isn't in the running because it lacks dimensional stability.)

•

Liquefied petroleum-gas sales in '59 increased 16.5% over '58 sales to hit a record near 8.7 billion gal. This jump comes on top of a substantial—but relatively small—7.5% increase in '58.

The well-known annual LPG report prepared by Benz, Devoe and Tucker of Phillips Petroleum shows this use breakdown for '59: domestic and commercial sales were up 9.4%, to 3.6 billion gal.; motor fuels, up 10%, to 937 million; industrial and miscellaneous uses, up 26.5%, to 1.02 billion; gas manufacturing, up 2.6%, to 245 million; chemical manufacturing, up 26.2%, to almost 2.4 billion; rubber components, up 32%, to 491 million.

•

Production of flake caustic soda has started at the Perkins, W. Va., plant of Allied's Solvay Process Division to supplement liquid caustic production.

Flake caustic will be packed in 400-lb. nonreturnable drums, will be priced at $5.20/100 lbs. in carlots, f.o.b Perkins, freight equalized against recognized producing points.

Initial output is at a slow pace, however, because solid caustic sales in the area are only fair; movement of liquid caustic, on the other hand, is reportedly good.

•

The ½¢/lb. price hike on n-butyl alcohol—posted last week by Union Carbide—will become industry-wide. Other producers now reveal they will make across-the-board markups to match UC's new prices, which become effective Jan. 1. The new tabs: 18¢/lb. in carlots, 19½¢ in less than carlots, 15½¢/lb. in tankers.

Producers say no price increases on isobutyl alcohol are planned now to maintain the previous 2¢/lb. price differential between isobutyl and normal butyl alcohols. Last summer, a 1¢/lb. price cut on isobutyl was explained as an attempt to broaden markets and re-establish the 2¢/lb. price differential between the two butyl alcohols (*CW Market Newsletter, Aug. 22 and 29*).

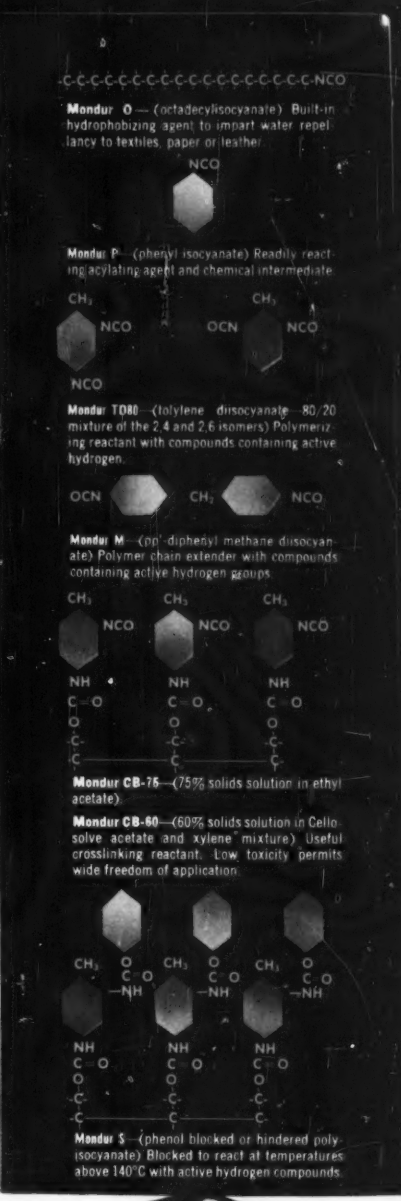
•

A new on-site oxygen/nitrogen unit is in operation at Mobay Chemical's plant at New Martinsville, W. Va. The installation—capable of making 25 tons/day of medium-purity oxygen and 25 tons/day of high-purity nitrogen—is another addition to Linde Co.'s expanding network of on-site plants (*CW, May 30, p. 89*). Mobay will use the oxygen in various isocyanate manufacturing processes.

SELECTED PRICE CHANGES—WEEK ENDING DECEMBER 14, 1959

	Change	New Price
UP		
Coconut oil, crude, tanks, N. Y.	$0.00375	$0.18625
Tin metal (Straits)	0.01	1.00
DOWN		
Citral, CP, bots.	$0.10	$3.65
Tankage, animal, feeding, 9-11% ammonia, N.Y., bulk, ton...	0.25	4.75

All prices per pound unless quantity is quoted.


Mondur O — (octadecylisocyanate) Built-in hydrophobizing agent to impart water repellancy to textiles, paper or leather.
Mondur P — (phenyl isocyanate) Readily reacting acylating agent and chemical intermediate.
Mondur TD80 — (tolylene diisocyanate 80/20 mixture of the 2,4 and 2,6 isomers) Polymerizing reactant with compounds containing active hydrogen.
Mondur M — (pp'-diphenyl methane diisocyanate) Polymer chain extender with compounds containing active hydrogen groups.
Mondur CB-75 — (75% solids solution in ethyl acetate).
Mondur CB-60 — (60% solids solution in Cellosolve acetate and xylene mixture) Useful crosslinking reactant. Low toxicity permits wide freedom of application.
Mondur S — (phenol blocked or hindered polyisocyanate) Blocked to react at temperatures above 140°C with active hydrogen compounds.

New Frontier of Product **Creation**

From building blocks for better products to stepping stones to outer space, the products of isocyanate chemistry are here today to meet the challenge of tomorrow's needs.

The versatile range of mono-functional, poly-functional, aromatic and aliphatic isocyanates manufactured by Mobay are even now being used to create superior coatings, rocket fuel binders, stronger elastomers, more versatile adhesives, more functional foams, chemical and pharmaceutical intermediates.

And this is just the beginning.

Many of these "building block" chemicals and polymers were developed to meet the specific needs of the prolific urethane product industries. However, the many different types of isocyanates developed by Mobay, and their readiness to react with so many different compounds, indicate that a whole realm of new product possibilities lies just beyond the threshold of present-day knowledge. This is the challenge.

It takes a creative chemist with vision to convert idea raw material into end product results. You may be the one. May we team up with you to find ways to put these busy molecules to work for your company?

Let's talk over your needs

Above is a partial list of the newest resource of engineering raw materials for industry—the new category of isocyanate polymers and intermediates developed by Mobay. They are waiting for you to translate them into action. Write for detailed technical information.

MOBAY CHEMICAL COMPANY
Dept. CW-1 Pittsburgh 34, Pa.

MOBAY
First in Urethane Chemistry

Mobay manufactures isocyanates polycarbonates and urethane chemicals for foams, elastomers and coatings.

interested in U.F. resins?

Allied U.F. CONCENTRATE—85 gives you 5 economies

This is how Allied's "U.F. Concentrate—85" saves money five ways over urea and formaldehyde compounded separately:

1

2

3

4

5

FASTER PROCESSING

because there's less water to evaporate. "U.F. Concentrate—85" gives you 60% formaldehyde, 25% urea, only 15% water.

LESS KETTLE CAPACITY, LESS STEAM REQUIRED

With a higher concentration of active ingredients, you can use a smaller kettle—or produce bigger batches with existing equipment.

NO HEATED STORAGE

You don't need it—even though "U.F. Concentrate—85" gives you the highest concentration of formaldehyde commercially available.

LESS STORAGE CAPACITY

for a given amount of active materials. Water content of "U.F. Concentrate—85" is a minimal 15%.

LESS MATERIALS HANDLING

because formaldehyde is of high concentration with urea in liquid form.

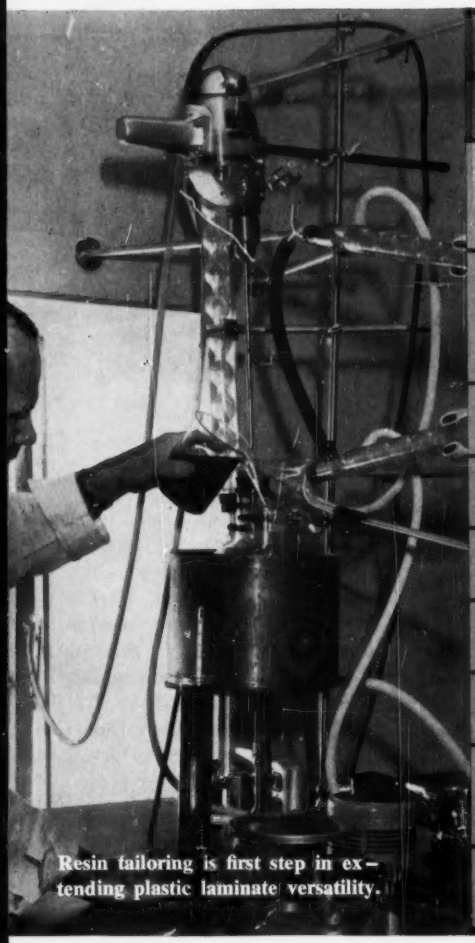
You'll find more details in Allied's 36-page brochure "U. F. Concentrate—85." Write for it.

NITROGEN DIVISION

Dept. UF 4-7-7, 40 Rector Street, New York 6, N. Y.

BASIC TO AMERICA'S PROGRESS

Allied Chemical



Resin tailoring is first step in extending plastic laminate versatility.

Plastic laminates' spectrum of uses

Resin type	*Web material*	*Typical industrial uses*
Phenolic	Paper	Terminal boards, insulating washers, high-voltage switchgear, printed circuits.
Phenolic	Cotton	Gears, pinions, cams, bearings, acid tank liners, vent ducts, circuit-breaker and switch arms, electrode supports.
Phenolic	Asbestos	Insulation, rotor vanes, caustic-resistant uses.
Phenolic	Glass	Structural parts in electrical applications.
Phenolic	Nylon	High-voltage applications.
Melamine	Glass	Circuit-breaker parts, switchboard panels.
Silicone	Glass	High-temperature, high-frequency uses.
Epoxy	Paper	High-humidity electrical applications, acid- and alkali-resistant uses.
Epoxy	Glass	High-temperature applications.

Cooking Up Tougher Plastic 'Sandwiches'

Last week's National Conference on the Application of Electrical Insulation, held at Washington's Shoreham Hotel, points up the progress in research to develop new resins and web materials for high-temperature-resistant plastic laminates.

It also underscores the efforts of laminate makers to go beyond the multimillion-dollar market their products have won in the electrical, building and machine parts fields (*table*), move into new areas, particularly missiles and rockets.

Industrial laminates are the tough "sandwiches" made by impregnating a number of layers of a web (cloth or mat) with a thermosetting plastic resin, then applying high pressure to form the finished product. Over a dozen companies manufacture them, using materials supplied by chemical process companies.

The best laminates now available can withstand 500 F for extended periods of time, but boosting this ceiling is a prime research goal. Today's laminates also feature a high strength-to-weight ratio, which helps account for their soaring popularity in structural applications. And even with their limitations, they are suitable for use under extremely severe conditions (e.g., rocket nose cones) for short periods of time.

New laminate raw-material candidates include a new hydrocarbon resin; a silicone resin that requires no solvent (thereby simplifying the lamination process); potentially useful web materials—one of asbestos-glass, the other consisting of a paper made from synthetic mica. And there are new laminates for printed-circuit boards and high-temperature insulation.

Resin Research: The Washington meeting occasioned the first detailed presentation of the electrical properties of the new hydrocarbon resin, developed by Esso Research and Engineering Co. at its Linden, N.J., laboratories and available in semi-commercial quantities from Enjay Co. (New York). The new resin is a butadiene-styrene copolymer that contains side vinyl groups. Curing is ef-

Seminars on

Random Evolutionary Operation
A Radical New Technique for

PROCESS AND PRODUCT OPTIMIZATION

REVOP or Random Evolutionary Operation is a completely new experimental technique for finding the best operating conditions for a complex process or the best specifications for a complex product.

Advantages of REVOP

(1) Equally fast and effective for processes and products involving two to over 100 variables.

(2) Easily understood and operated by persons with technical training or manufacturing supervisory experience.

(3) Equally effective in factory, pilot plant, laboratory, or theoretical investigations.

(4) In trial runs to date (on very complex synthetic examples), it has never failed to go 90% of the way from the starting conditions to the best possible conditions in less than twenty experiments.

Who Should Attend REVOP Seminars?

Research Engineers and Scientists
Chemists and Chemical Engineers
Design Engineers (specification and tolerance optimization)
Process Engineers and Manufacturing Supervisors (process optimization)
Industrial Engineers (trouble shooting)
Quality Control Engineers and Laboratory Supervisors
Reliability Engineers (components and systems)
Staff Statistical Consultants (planning experimentation)
Operations Research Personnel (management applications)
Cost Accountants (cost reduction programs)
Electronic Computation Groups (optimization of complex functions)
Manufacturing, Engineering, Research and General Managers

Registration by letter (or phone) giving name, address, title, and function and the types of products, processes and problems to be investigated. Tuition is $25 including text material and luncheon. Enrollment is limited and immediate registration, at least tentative, is necessary.

Dates and Places: One day seminars (8:30 A.M. to 5:00 P.M.) will be held as follows: January 15, Boston; January 18, Philadelphia; January 19, New York; January 25, St. Louis; January 26, Chicago; January 28, Cleveland; January 29, Pittsburgh; February 1, Houston; February 2, Los Angeles.

Technical Material: Manuscript copies of Report No. 10/10/59. "REVOP-Random Evolutionary Operation" (40 pages) are available at $4.00 each.

Statistical Engineering Institute
F. E. Satterthwaite, *Director*
8 Fuller Road
Wellesley Hills, Massachusetts
CEdar 5-6335

fected either by heat or (for faster cures) by addition of 30-50% of a cross-linking monomer such as vinyl toluene. The resin features low water absorption and good resistance to acids and alkalis. Originally known as C-acid MD-428, it received a new name last week: Buton A-500.

The new solventless silicone resin, developed by Union Carbide Silicones Division and known by the experimental name Y-2263, does away with the necessity of removing solvent in the curing step, makes possible a simplified lamination process.

A relatively new resin with good potentialities is diallyl isophthalate (DAIP), which extends the useful temperature range of the diallyl phthalate resins to about 500 F, when filled with glass fiber. A point emphasized by Food Machinery and Chemical Co.—maker of DAIP and conventional diallyl orthophthalate (DAP)—is that these materials are not strictly polyesters, since the allyl groups, not the ester linkages, are involved in formation of the polymer chain.

And Du Pont says its FEP Teflon, soon to be available in commercial quantities, will have potential insulation uses.

Webs and Laminates: Closely allied to the study of resins is the research going into the development of new web materials and of new laminates from older starting materials. Johns-Manville (New York), for instance, is out with a new asbestos-glass insulation (Quinorgo R-4) that's formed by depositing asbestos fiber on both sides of glass cloth.

Minnesota Mining and Manufacturing Co. (Minneapolis) recently put a new paper on the market, made of synthetic mica. Another new 3M product is a printed-circuit material (called Cu Clad)—a laminate of polytetrafluoroethylene and glass cloth with copper bonded to it.

Synthane Corp. (Oaks, Pa.) last week showed off products combining some of the new materials into new laminates featuring flame retardance and resistance to temperatures up to 500 F. For both items, Synthane uses a modified phenolic resin: one (Grade ARF-HT) in conjunction with an asbestos mat, the other (Grade G3-HT) with glass fabric.

Laminator's Role: Laminate makers, as well as producers of the raw

Taylor Fibre's Thacker sees 5% of sales as his R&D budget target.

materials, are actively engaged in research and development of new products. Taylor Fibre Co. (Norristown, Pa.), for example, has recently added a new technical director, Carlisle Thacker, reported a major laboratory expansion, and is now shooting for a research and development expenditure rate of 5% of sales.

Taylor carries on a wide range of research activities, from development and modification of resins to formulation of new laminates with specific properties (e.g., fire retardance). Although the company doesn't make its new monomeric materials, it's prepared to synthesize new compounds or modify commercially available ones in the lab.

The usual procedure, though, is to have an end-use first, then work toward a product that will meet it. The circumstances of the application generally narrows the selection of web materials. Also limiting the choice are the standards set by the National Electrical Manufacturers Assn. (NEMA).

Next step normally would be to test different resins by laminating them with the web, trying the result in use under controlled conditions. (Taylor has lab-scale laminating facilities as well as a controlled climate chamber for testing.) However, the sequence is complicated if another additive, such as a flame-retardant compound, is required. In this case, a proper component balance must be achieved to reach the desired fire-retardant properties without harming

TBP

TRIBUTYL PHOSPHATE

1. SOLVENT EXTRACTION OF METAL IONS TBP provides extensive application for solvent extraction of metals and rare earths in the form of their nitrate salts. This is particularly true for metals associated with the atomic energy processes, beginning with the initial preparation of the ores and on to the recovery of the metals from spent reactor fuels.

2. OUTSTANDING ANTI-FOAM AGENT Tributyl Phosphate leads the field in the control of foam during the manufacture, can-filling, and final application of synthetic latex emulsion paints. TBP is preferred, too, for paper coatings, water adhesives, casein solutions, inks, textile sizings and detergent solutions. Tributyl Phosphate offers exceptional cost-efficiency value and minimal residual odor.

3. SUPERIOR HEAT EXCHANGE MEDIUM As a fluid heat exchange medium, Tributyl Phosphate is notable for being useful over such a wide range of temperature. When compared with aqueous solutions and halogenated compound, TBP offers many unique advantages. It is non-corrosive, non-flammable, non-volatile and is of a low order of toxicity.

TBP Can Help You! Mail Coupon!

INDUSTRIAL CHEMICALS DEPT.
COMMERCIAL SOLVENTS CORP.
260 MADISON AVE.
NEW YORK 16, N. Y.

Please send me additional information on Tributyl Phosphate with regard to its use in:

- ☐ solvent extraction.
- ☐ foam reduction.
- ☐ heat exchange use.

Name_____

Title_____

Company_____

Street_____

City_____ Zone____ State____

INDUSTRIAL CHEMICALS DEPARTMENT

COMMERCIAL SOLVENTS CORPORATION

260 MADISON AVE., NEW YORK 16, N. Y.

Atlanta • Boston • Chicago • Cincinnati • Cleveland • Detroit • Kansas City
Los Angeles • New Orleans • Newark • New York • St. Louis • San Francisco
IN CANADA: McArthur Chemical Co. (1958) Ltd., Montreal • IN MEXICO: Comsolmex, S. A., Mexico 7, D. F.

MATHIESON

ammonia

(NH_3)

N

National distribution from major producing points at Lake Charles, La., Marcus Hook, Pa., Niagara Falls, N. Y., and Louisiana, Mo., assures dependable supply.

H

High purity in all grades. Anhydrous—refrigeration grade, commercial grade, and aqua—26° Bé (29.4%).

H

Helpful technical service assures economical handling, storing, using.

H

Have a talk with your purchasing department today—then call Olin Mathieson.

MATHIESON

OLIN MATHIESON
CHEMICAL CORPORATION
Chemicals Division • Baltimore 3, Md.

6842

the electrical or mechanical properties. When no combination of existing materials will work, development of new resins or additives is necessary.

Taylor believes that laminates have a good future in structural uses as well as for higher-temperature electrical applications. The aircraft and missile industries both show interest in laminates. For example, Westinghouse Electric Co.'s aviation gas turbine division (Kansas City, Mo.) has made a jet engine housing out of a polyester-glass laminate (*CW, Dec. 12, p. 70*).

With a continued research push from raw-material producers, laminate makers and ultimate users, these versatile materials seem assured of meeting a growing list of uses requiring good strength retention at ever-higher temperatures.

Trace Metal Trapper

Details of a new technique for extracting uranium, copper and other metals from sea water are emerging this week from a report by inventor Felix Sebba of the University of Witwatersrand, Johannesburg, South Africa. The preliminary report was authorized by Armour & Co. (Chicago), new owner of the Sebba process (CW Technology Newsletter, July 18).

Essentially, Sebba uses surface-active agents—either anionic or cationic, depending upon the ion sought—to cull metal ions from sea water. Air is bubbled through water to which the surfactant has been added; the surfactant concentrates at the bubbles and attracts oppositely charged metal ions, which are carried to the surface as froth or scum. This is then processed to obtain the metal.

Anions floated this way by Sebba include ferrocyanide, ferricyanide, cobalticyanide, platinichloride, fluoroberyllate, uranylsulfate anion, chromate, vanadate, molybdate and argentocyanide. Cations floated include copper, nickel, nickel ammonium, cobalt, aluminum, zinc, manganese, barium, strontium and thorium.

For gathering anions, including complex metal anions, Sebba reveals that the cationic surfactant may be a quaternary ammonium salt, one radical of which is a 10-carbon, or higher, chain. For floating cations, the anionic "collector" may be sodium laurate, palmitate, or the sodium salt of sulfated fatty acids. Costs and rate of surfactant addition are not given in the preliminary report.

Collectors must be in molecular—not micelle—form. Ions absorbed on micelles yield stable colloids that have no tendency to float and are not easily disintegrated. Also, if the froth or scum is churned under the sea-water surface, it may form a hard-to-handle colloidal dispersion. This latter difficulty is avoided by keeping the bubbles small and slow-moving, so as not to disrupt surface froth, and also by removing the froth as it is formed.

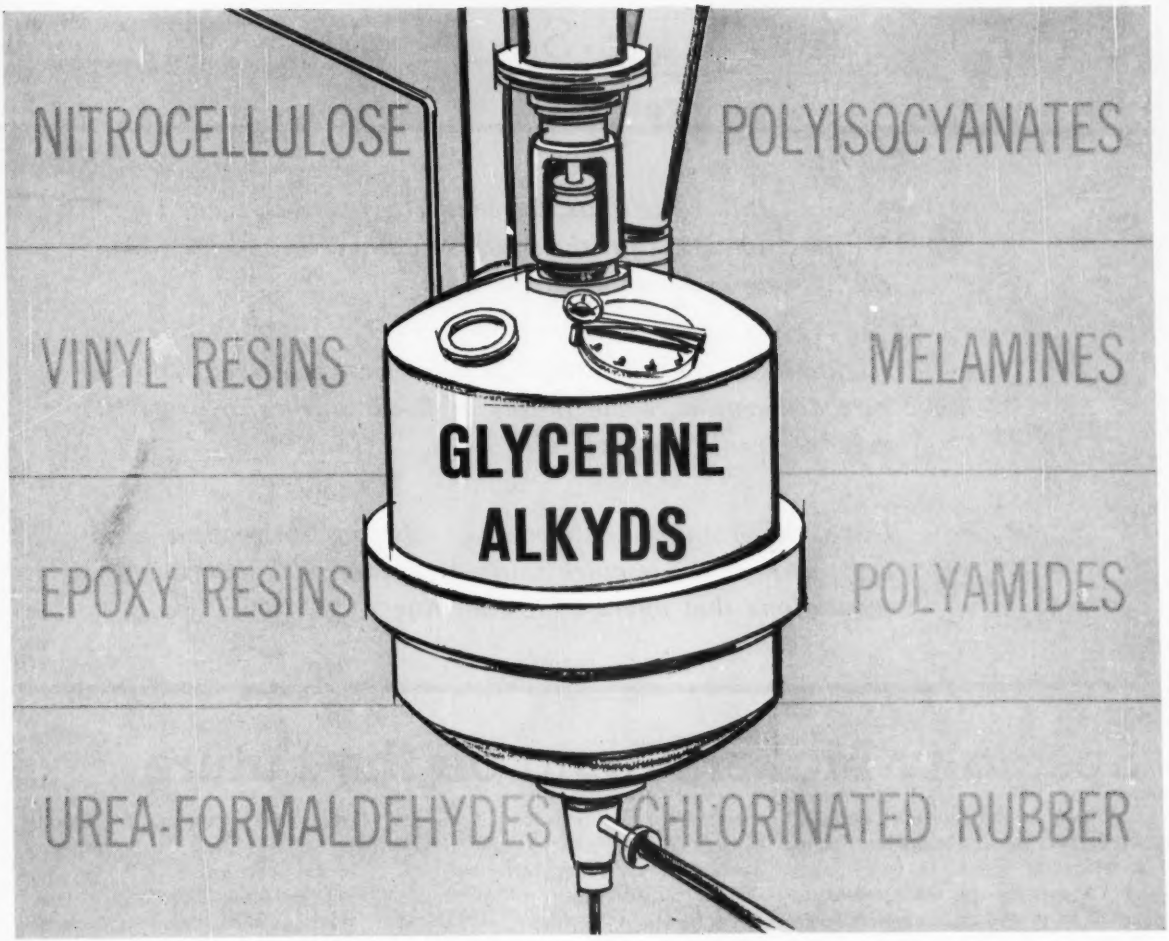
Metal may be recovered from the froth by ignition and destruction of the collector with which it is combined. Or the collector (e.g., a metallic soap) may be dissolved in alcohol from which the insoluble salt of the metal ion is then precipitated. The collector is then recovered from the alcohol.

In addition to the new method's use in extractive metallurgy, especially in recovering trace quantities of metals from sea water, it may be useful for purification of chemicals and in the recovery of wastes or by-products, Sebba believes.

But the big potential is illustrated by these estimates by Sebba: if a "curtain" of bubbles were introduced into the ocean from a pipe 100 meters long, at a depth of 100 meters, where the current flows at three knots, the bubbles would sweep large quantities of metals in one hour—27,500 kg. of aluminum, 50-100 kg. of copper, 150 kg. of uranium, 300 grams of gold. If a "reasonable" fraction of these metals could be collected and carried to the surface, Sebba believes, the process would be of economic—even strategic—importance.

EXPANSION

• The Dept. of Defense is setting up a plastics technical evaluation center at the Army Ordnance Corps' Picatinny Arsenal (Dover, N.J.). It will be opened in early '60, is expected to narrow the gap between research and applied engineering of military plastics and reinforced plastics, according to John Townsend, special assistant to the director of defense, research and engineering.



Greater compatibility with alkyd modifiers

Glycerine outperforms other polyols in merging alkyds with modifiers. It lessens tendency to gel during cooking. It permits more flexibility in the condensation process. And the resulting modified alkyds are more soluble, have better clarity and greater resistance to haze.

Glycerine alkyds are compatible with a great variety of modifying polymers. Properties such as gloss, adhesion and durability are improved—broadening an already wide spectrum of alkyd resin properties.

Glycerine is stable in price, dependable in supply. It offers a unique range of advantages for alkyd resins. We'd like to send you our new booklet, "Glycerine Properties • Reactions • Performance." Address your request to the Glycerine Producers' Association.

Properties

HYGROSCOPICITY • STABILITY
SOLVENT POWER • VISCOSITY
NONVOLATILITY • NONTOXICITY
TASTE • COMBINING WEIGHT

ADVANTAGES THAT COME WITH . . .
Glycerine

Applications

HUMECTANT • CARRIER
SOLVENT • LUBRICANT
SOFTENER • EMOLLIENT
ANTI-FREEZE • ALKYD BASE

GLYCERINE PRODUCERS' ASSOCIATION • 295 MADISON AVENUE, NEW YORK 17, N. Y.

- ***Nearly 1,000 registrants, the biggest crowd yet, turned up in Washington, D.C., for the 46th annual meeting of the Chemical Specialties Manufacturers Assn.***

- ***Highlighting the affair were sessions concerned with the future of aerosols, some trends in floor finishes, a new fatty acid derived from tall oil.***

- ***Out of the meeting should come a stiffening resistance to product certification, a more unified position on governmental regulations that affect CSMA members.***

Specialty Makers Sight on the Future

A look at the future of aerosols, a progress report on insect attractants, a review of trends in floor waxes and a message to management to curtail its empire building were some of the items ladled out to the 952 registrants at last week's Chemical Specialties Manufacturers Assn. meeting at Washington, D.C.'s Mayflower Hotel.

Here are some highlights of the 46th annual meeting:

• Self-polishing floor waxes of tomorrow were described by John Steinle of S. C. Johnson. He predicted that, in the near future, advances in the development of synthetic ingredients will make possible a vastly superior product to those now on the market. According to Steinle, properties built into a new type of polymer emulsion will result in a polish that will give higher gloss, resist wear under normal traffic for several months, regain initial gloss without rebuffing, and be impervious to spotting by water. Also it will be readily removable by adding a common chemical to the wash water. But Steinle did not name specific classes of compounds he felt would promise these properties. He also said that while the trend in the $100-million floor wax industry is toward synthetics such as polymers, much research is being done in natural raw materials, including carnauba wax. Other factors which will determine floor waxes of the future, in addition to scientific advances, will be the new trends in floor-covering materials.

• An evaluation of a new tall oil-derived fatty acid for floor polishes was presented by a group from Foster D. Snell, Inc., and West Virginia Pulp and Paper Co. Indusoil W-90, they say, has been found to be at least as efficient as the conventionally used oleic acid in preparing stable, bright-drying floor waxes. Compared with polishes containing oleic acid, Indusoil waxes are said to show slightly superior leveling properties and higher soil resistance. Because less fatty acid is required in this type of polish, Indusoil could be an important factor in keeping costs down, according to the speakers.

• By 1968, production and sales on nonfood aerosols should double, with the pushbutton products selling at a rate of 1 billion units/year, predicted Ralph Crane, market research manager for Du Pont's Freon Division. He said that about 80 million food aerosol units, mainly whipped toppings, were turned out in '58 with compressed gases such as nitrous oxide and carbon dioxide. This area, he said, may see the biggest growth in the next decade.

Other predictions for the next 10 years included these estimates: average annual production rate of the aerosol industry should increase 7½%/year. Aerosol insecticides will be produced at the rate of 107 million units/year in '68, compared with 71 million in '58. Room deodorant sales will jump from 63 million units in '58 to 113 million in '68. Shave cream should increase to 100 million units from last year's 65 million.

The A. C. Nielsen Co. gave further predictions on aerosols. J. O. Peckham predicted that in the food and drug field, shampoos, men's hair dressings, hair tonics, all-purpose household cleaners, and furniture polishes appear to have the biggest potential.

Postprandial Philippic: Business-novel author Cameron Hawley, looking somewhat like a thin Theodore Roosevelt, told the lunchers that foreign competition was going to be an increasing threat to U.S. companies—not because of the difference in factory wages but because of the unnecessary overstaffing at the managerial level. He pointed out that West German firms manage the same produc-

"...and here's the first thing I ever printed."

Get fast delivery of Spencer Ammonia from: (1) Pittsburg, Ks.; (2) Henderson, Ky.; (3) Vicksburg, Miss.; or (4) Calumet City, Ill. (Aqua Ammonia only.)

NEED AMMONIA?...

Discover for yourself why so many of our customers say Spencer Ammonia service is wonderful. Whether you use Aqua Ammonia, Commercial Grade Ammonia or Refrigeration Grade Ammonia, write, wire or phone your order to Spencer Chemical Company. Spencer also produces Metals Grade Ammonia, the purest ammonia on the market today. Ask about it!

SPENCER

"Tanky"...The Symbol of Spencer Service

SPENCER CHEMICAL COMPANY

America's Growing Name in Chemicals

SPENCER PRODUCTS: Ammonia (Commercial, Refrigeration and Metal Treating Grades) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Prilled Ammonium Nitrate • Argon • Methanol • Formaldehyde • FREZALL (Spencer Dry Ice) • Liquid CO_2 • Cylinder Ammonia • Nitric Acid • Uranium Dioxide • "Poly-Eth" Polyethylene • "Poly-Pro" Polypropylene • Spencer Nylon • "Mr. N" Ammonium Nitrate Fertilizer • Spencer Urea Fertilizer • SPENSOL GREEEN and URA-GREEEN (Spencer Nitrogen Solutions) • SPEN-AMM Anhydrous Ammonia

GENERAL OFFICES: Dwight Bldg., Kansas City 5, Missouri

DISTRICT SALES OFFICES: 575 Lexington Avenue, New York City; First National Bank Bldg., Chicago, Illinois; Candler Bldg., Atlanta, Georgia; 8401 West Dodge Road, Omaha, Nebraska; 2158 Union Avenue Bldg., Memphis, Tennessee

For Control of Bacteria and Fungi

Irgasan BS200

Tetrachloro-salicylanilide

U.S. Pat. 2703332

Substantive to skin, textiles
Easy to demonstrate or trace
Fluoresces under ultra violet light

For use in
Deodorant Soaps
Laundry Detergents, Rinses
Household Specialties
Hospital Cleaners
Textile Finishes
Preservatives
Sanitizers
Cosmetics
Shampoos
Rubber
Plastics

Write for literature and samples today

Geigy

Geigy Industrial Chemicals

Geigy Industrial Chemicals
Ardsley,
New York

tion rates as their U.S. counterparts but with one-fourth the managerial force. He attributed the overcrowding at the top to two things: the trend away from family owned to publicly owned companies and the desire on the part of present executives—reared in depression times—to be as little as possible like the autocratic businessmen of 25-30 years ago. However, Hawley sees a favorable movement away from the present condition of business "where committees are sprouting like mushrooms in the lush atmosphere of air-conditioned executive suites" to one where dynamic leadership of one or two individuals is allowed to assert itself.

Hit Product Certification: At this meeting CSMA decided that the association would go on record as being opposed to "product certification" requirements such as those published by the American Hotel Assn. A special committee was appointed to carry out the project of resistance to the product certification procedures, and pending consultation with its legal council, CSMA may soon come out with a public statement of its policy in regard to this matter.

The group selected a new slate of officers at the meeting. George Fiero of Esso Standard Oil Co. was elected president and H. W. "Doc" Hamilton, long-time secretary of CSMA, was appointed to the newly created post of executive vice-president. Other officers elected were Charles E. Beach (John C. Stalfort & Sons, Inc.), first vice-president; Charles E. Allderdice, Jr. (The Bell Co.), second vice-president; Frederick G. Lodes (Lodes Aerosol Consultants Inc.), treasurer; and A. A. Mulliken (CSMA), secretary.

The next meeting of CSMA will be the 46th midyear meeting at the Drake Hotel in Chicago on May 16, 17 and 18.

Lever Adds Liquid All

A new, liquid form of All detergent is now being test-marketed by Lever Bros. in Toledo, O., and Spokane, Wash. Described as a totally new formulation, the low-sudsing, heavy-duty liquid features optical whiteners said to be particularly effective on Dacron polyester fibers.

Currently, the novel form of All is available in one package size only —a 32-oz. metal can, which retails for about 79¢. Continental Can, which makes the container, describes it as one of its conventional quart syndet cans—unlined, with a polyethylene pouring spout, and with side seam organically bonded.

Although the polystyrene cap on the can serves as a measuring unit, Lever says the new All is aimed at automatic washing machines that have reservoirs for the full quart of syndet, and which dispense the needed amount each wash cycle.

The new All reportedly contains dodecyl phenol ethylene oxide adduct (about 10%), tetrapotassium pyrophosphate (about 25%), soap and small amounts of stabilizers to keep the dispersion from separating (Lever may also have a new mixing technique). Fluid Chemical (Newark) is making the new All, packaging it for Lever.

The Dacron whitening properties of the new All are due to a combination of whiteners. Although Lever won't confirm it, trade sources say the whitener is Ciba's Uvitex ERN. Ciba, also, won't confirm or deny that its product is the "secret" ingredient of All. It does say, however, that ERN is particularly effective with Dacron, and that it has "outstanding" light-fastness.

PRODUCTS

Bug Spray: National Control Laboratories (5315 Touhy Ave., Skokie, Ill.) has a new aerosol insect-barrier spray called "Crawlz No More." The compound is a sticky substance that can be applied around trunks of trees or branches of plants. Insects and rodents setting their feet in it find it almost impossible to escape. It is reported odorless and harmless to plants, animals and people. A 14-oz. container retails for $2.50.

•

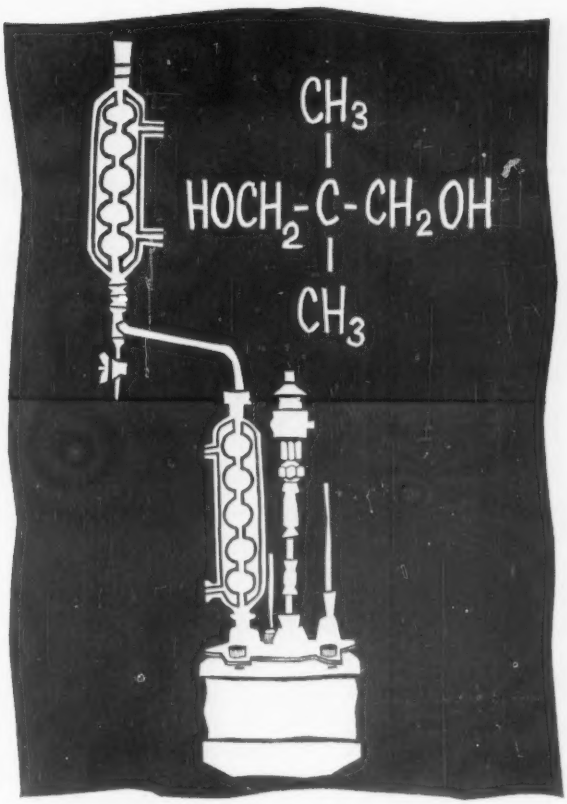
Welded Pail: Continental Can Co. (New York) is selling a leakproof, 5-gal. flaring pail with a one-piece, one-seam electrically welded body. Offered in 29-gauge steel (heavier gauges will follow), the pail is first welded into a straight-sided shell, then the shell is stretched into the flare. This method is said to be new to steel containers construction. It is suggested for packaging liquids, e.g., roofing cement, paint and petroleum products. Price is $695/thousand.

metallic catalysts speed synthesis of NEOPENTYL GLYCOL POLYESTERS

Report from Eastman research

direct polyesterification on commercial scale now practical

derivatives noted for resistance to heat, water and sunlight



Direct polyesterification reactions of neopentyl glycol with dibasic acids have been under intensive study at Eastman's Development Laboratories for more than a year.

Results of this work show that the long reaction period normally associated with the preparation of neopentyl glycol polyesters may be shortened considerably through use of the proper metallic catalyst system.

The study demonstrates, too, that the problems of side reactions, color formation and polyester cracking, which attend lengthy reaction periods at high temperatures, are minimized through shorter reaction times.

A report on the nature of the catalyst evaluated and the procedures and techniques employed is available upon request.

Interest in polyesters based on neopentyl glycol stems from the stability characteristics it possesses and, in turn, imparts to its derivatives.

These stability characteristics are attributed to the compact, symmetrical molecular configuration of neopentyl glycol, and, in particular, to the presence of the two methyl groups on the central carbon atom.

For example, when neopentyl glycol is condensed with a dibasic acid it results in an easy-processing plasticizer of moderate molecular weight that exhibits permanence properties equal or superior to those of polymeric plasticizers of higher molecular weights.

Eastman offers such a product in its polymeric plasticizer NP-10.

Certain hydroxy-terminated polyesters of neopentyl glycol show promise in the manufacture of both rigid and flexible polyurethane foams.

These foams feature better tensile properties and improved resistance to sunlight and heat.

Unsaturated polyester resins made with neopentyl glycol can be formulated to meet an extended range of desirable mechanical requirements.

The electrical properties of several of these suggest their use in insulating varnishes. Others, because of their hydrolytic stability, may be useful as water-soluble resins.

Among other derivatives of neopentyl glycol that warrant investigation are unsaturated polyester resins for cross linking with styrene; monoesters through diester interchange with neopentyl glycol for hydraulic fluids; and diesters for lube oil additives and for synthesis of specialized lubricants.

A copy of the technical data report describing this study as well as samples of neopentyl glycol may be obtained through your Eastman Chemical sales office or from Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

Eastman
CHEMICAL PRODUCTS, INC.
subsidiary of Eastman Kodak Company
KINGSPORT, TENNESSEE

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; Atlanta; Chicago; Cincinnati; Cleveland; Detroit; Framingham, Mass.; Greensboro, North Carolina; Houston; New York City; Philadelphia; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

Fission Fragments Open Radical

A new scheme for synthesizing chemicals by the direct application of nuclear energy was unveiled last week by Hercules Powder Co. (Wilmington, Del.). Key: utilization of high-energy "fission fragments"—the debris of split uranium-235 nuclei—to initiate reactions between organic compounds that would not normally combine with one another.

Hercules, which launched its chemonuclear research project about 10 years ago, feels that results to date are significant enough now to talk about, although a lengthy development program still lies ahead. Like competitive nuclear power, chemonuclear processing isn't expected to be commercial until the mid-70s. Arthur Martin, who heads the Hercules project, predicts "no earth-shaking applications in the immediate future, but good long-range prospects" for fission-fragment processing. And it's no secret that Hercules could use help in carrying the development burden.

Boosting Nuclear Efficiency: Most of the past and present applications of nuclear energy to chemical processing utilize only the alpha-, beta- and gamma-radiations and neutron energy. But the unused fission fragments, Martin points out, contain as much as 80% of the total energy released by fission. By putting this portion to useful work, a chemonuclear reactor can increase 10-fold the output per unit of fissionable fuel.

In the direct synthesis of ethylene glycol from methanol, for example, Hercules estimates energy consumption would run about 10 thermal-kwh./lb. (50 electron volts per mole of glycol formed). Technical feasibility of this reaction has already been proved in small-scale tests in Argonne National Laboratory's CP-5 reactor. And Hercules' estimates of economic feasibility indicate that a "small, but positive, return" could reasonably be expected on a commercial-scale plant. Cost forecasts include a credit for small quantities of formaldehyde co-produced by the fission-fragment reaction, but none for the sizable—and potentially salable—quantities of by-product nuclear-reactor heat.

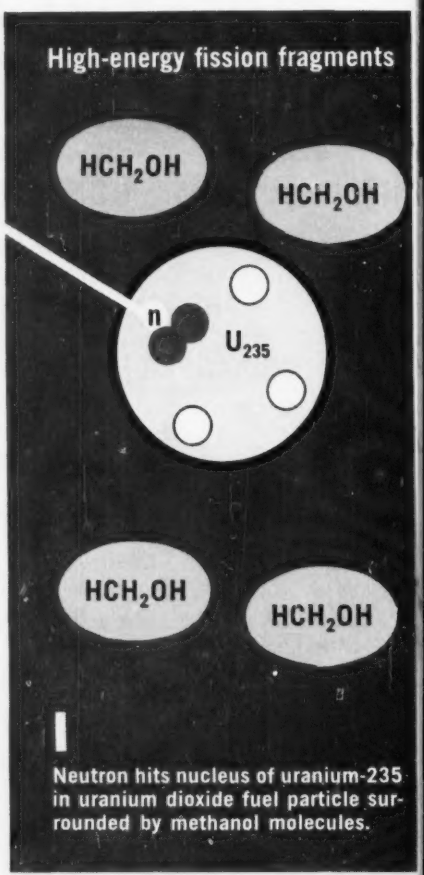
Reaction Mechanics: The trick in making normally unreactive organic compounds combine into desired products is to create large quantities of highly reactive free radicals (*CW, Mar. 2, '57, p. 46*). And that's a job that fission fragments do very efficiently.

The sequence of synthesis events *(drawings at right)* starts with the fissioning of a uranium-235 nucleus in enriched uranium dioxide fuel. Fission fragments ejected from the fuel particle carve a path through surrounding gas molecules. When molecules in the path are struck by a fragment, they are ionized or torn apart into free radicals. These active groups then recombine, some reverting to the original compounds, others forming a variety of new compounds.

The random realignment of free radicals makes fission-fragment processing less specific than other types of radiation techniques (e.g., the gamma irradiation of polyethylene to produce cross-linking). Therefore, it's not suitable for the production of long-chain polymers and similar materials. Complexity of the starting materials creates other problems, says Martin, arising from the creation of too many species of free radicals. This increases the formation of side reactions with a corresponding loss in yield of the desired product.

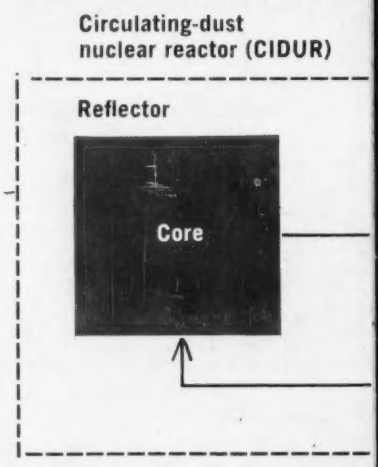
Fission fragments can best be used, Hercules feels, for relatively simple reactions, such as dimerization of the less-complex organics. In addition to glycol synthesis from methanol, a number of other potentially commercial reactions have been studied and reported in the company's German and Canadian patents (DPA 1,045,403 and Canadian patent 576,979).

Several of these alternate syntheses produce mixed products. Starting with methyl acetate, for example, three products are formed: dimethyl succinate, by a joining at the acetate end of the molecules; glycol diacetate, by a joining at the methyl end; beta-acetoxypropionic ester, by a head-to-tail recombination of the free radi-



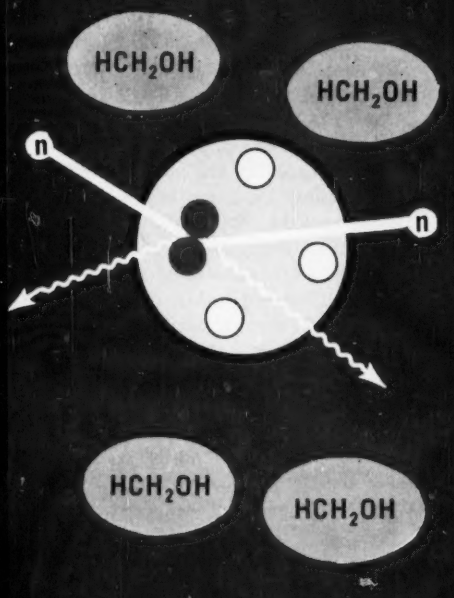
Neutron hits nucleus of uranium-235 in uranium dioxide fuel particle surrounded by methanol molecules.

Dust reactor is heart of fission



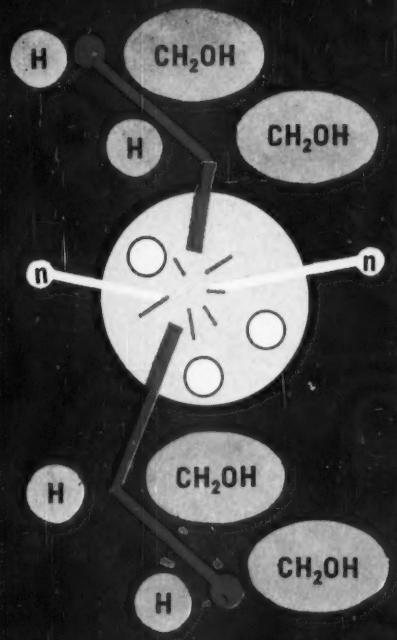
Route to Chemicals Via the Atom

initiate free-radical reactions



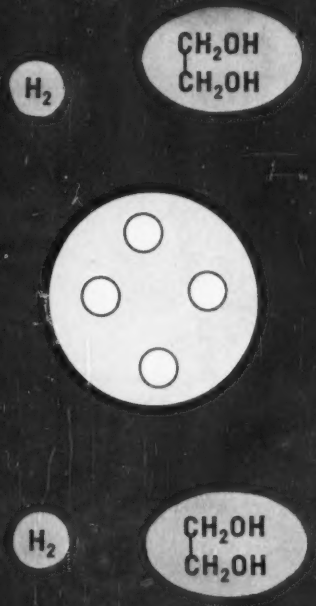
2

Fission produces more neutrons, radiation and fission fragments carrying 80% of energy released.



3

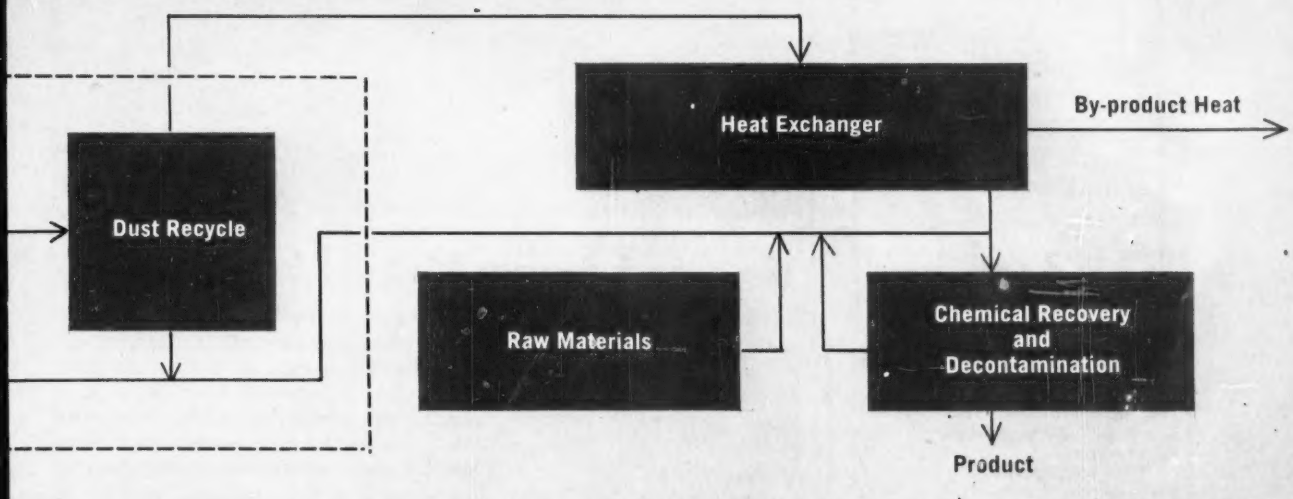
Fission fragments collide with methanol molecules, causing them to break up into free radicals.



4

Free radicals recombine to form ethylene glycol and lesser amounts of formaldehyde, other products.

fragment processing cycle



GLYCO

EMULSIFIERS

SYNTHETIC WAXES

DIMETHYL HYDANTOIN —AND DERIVATIVES

CHELATING AGENTS —THE TETRINES®

GLYCO CHEMICALS
division of
CHAS. L. HUISKING & CO., INC.
417 Fifth Ave., New York 16, N. Y.
Phone: ORegon 9-8400. Cables: Glycopon, N. Y.—Plant at Williamsport, Pa. Chicago Office: 435 No. Michigan Ave.

IMPORTANT FRENCH PRODUCER
of
Chemicals and Pharmaceuticals

DESIRES CONTACTS
with
AMERICAN FIRMS
INTERESTED IN HAVING THEIR PRODUCTS MANUFACTURED
Under a License Arrangement Within The
EUROPEAN COMMON MARKET

EXISTING FACILITIES INCLUDE
Organic Syntheses Equipment and Large Diversified Fermentation and Extraction Equipment.
Please Write To:
BO-3230—Chemical Week
Class. Adv. Div., P. O. Box 12, N. Y. 36, N Y.

cals. The latter is the major product, can be converted into methyl acrylate by splitting out acetic acid.

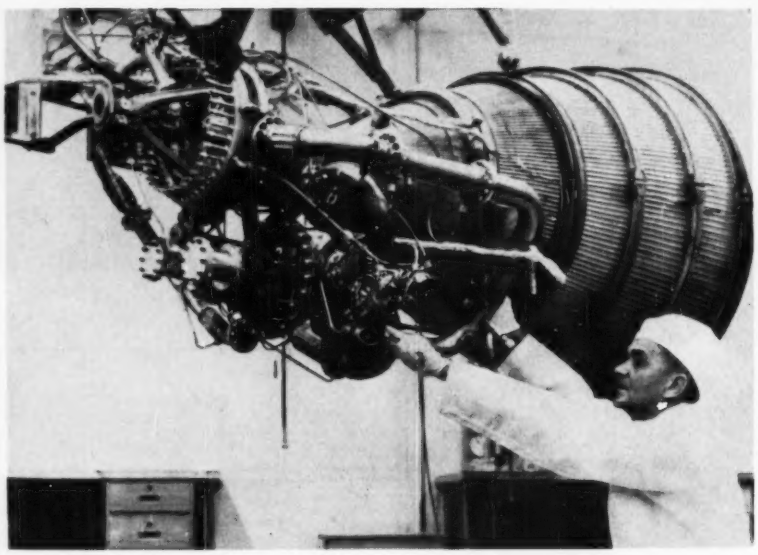
Other product combinations suggested in the patents: methyl succinate from acetic acid; butanediols, octanols and dodecanes from ethanol and hexane; succinonitrile from acetonitrile; dimethoxybiphenyl and glycol diphenyl ether from anisole.

Development Hurdle: Despite the intriguing prospects of fission-fragment processing, Hercules is the first to admit that the technique is many years — and many millions of development dollars — away from the threshhold of commercial application. Research Director Robert Cairns says a chemical company might be expected to finance a plant on its own, but doesn't see how a single firm could underwrite the total cost of development. And President Albert Forster emphasized that management has a hard choice to make between nuclear processing's potential payoff and the more-certain return on an equal investment in conventional projects.

Hercules has already taken the first step toward enlisting development aid, has been trying for two years to interest AEC in a chemonuclear reactor project under the civilian reactor development program. Now AEC is beginning a project at Brookhaven National Laboratory aimed at nitrogen fixation by chemonuclear techniques. Dynamic tests with an in-pile process loop are currently being run by Paul Harteck and Seymour Dondes of Rensselaer Polytechnic Institute (Troy, N.Y.); Hercules' scientists are serving as consultants.

A basic consideration in fission-fragment processing is the problem of plant size. The technique is definitely limited to large-volume operations, says Martin, probably in the 100 million-lbs./year range. This calls for a $20-30-million plant with a reactor capacity of about 100 thermal megawatts—roughly one-third to one-half the size of those proposed for commercial nuclear power plants.

Reactor Design: The only type of reactor suitable for chemonuclear



New and Bigger Muscle for Missiles

The Pentagon gained a welcome addition to its stable of missile-propelling rocket engines last week as XLR 115—the first liquid-hydrogen-fueled power plant (*above*)—passed its firing tests (*CW Technology Newsletter, Dec. 12*). The XLR 115, developed at Pratt & Whitney's West Palm Beach, Fla., plant, tops the specific impulse of oxygen-kerosene-fueled engines by more than 30%. Teamed with an Atlas first-stage, it will provide the second-stage thrust for the Centaur missile, which is designed to launch a 2,000-lb. payload on deep space missions.

processing, says Hercules, is a system fueled with uranium oxide dust. Reason: small particle size shortens fission-fragment paths through the fuel, thereby conserves energy that would otherwise be lost through collisions within the solid. The fuel dust can't be too fine, however, or it would clutter up the fragments' paths through the gas particles. Recommended dust size is less than 10 but greater than 0.5 microns.

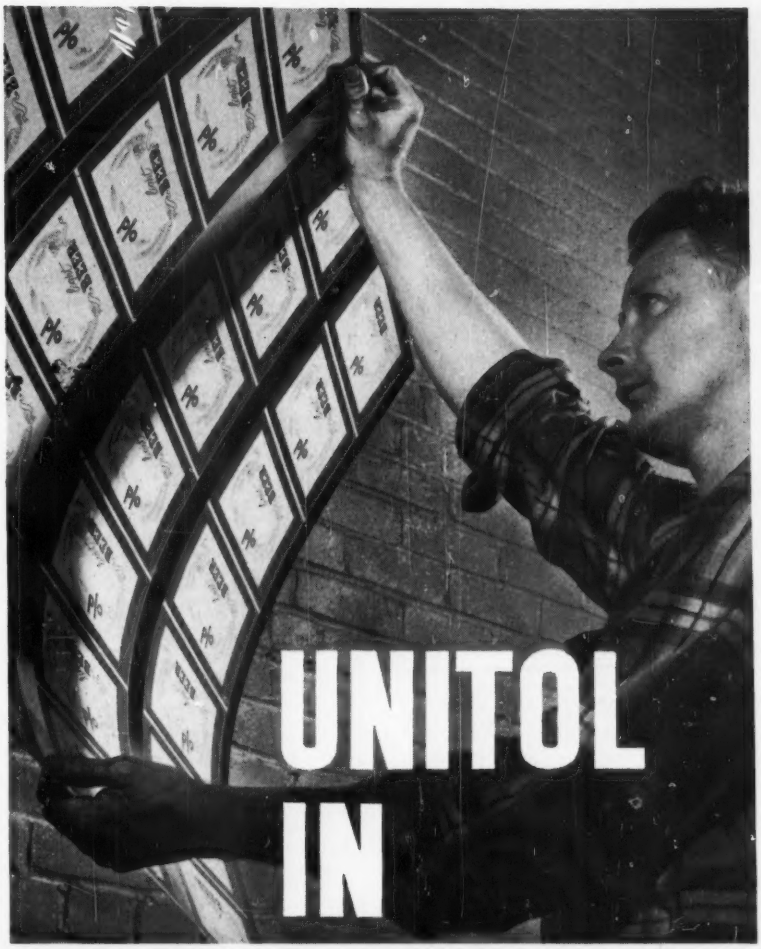
Hercules' experimental runs, conducted with a contract-research assist from Battelle, employed a thin film of fuel which offered a short path in only one direction. Harteck and Dondes are using a fiber form that shortens the path in two directions. But fine fuel particles afford fission fragments a short escape route in all directions, are expected to provide the best energy economy.

A dust-fueled reactor presents handling problems because the dust tends to agglomerate and to adhere to equipment surfaces. For another thing, it's essential to prevent criticality in processing units other than the reactor core itself, through the use of many small units (e.g., cyclone dust separators). And because the dust will be circulated through the entire system, the external cooling equipment must be designed to minimize energy losses at the heat transfer surfaces. From the technical point of view, says Martin, these problems "appear amenable to solution—but at a cost."

Boosting Yields: Control of the synthesis reaction depends on a number of variables, will require additional study. But Hercules has already uncovered two of the vital keys to high conversion yields.

Initial tests of fission-fragment treatment of methanol provided a glycol yield of only 4%, since many of the hydrogen-free radicals recombined with methylol groups. By diluting the gaseous raw material with water, Hercules researchers boosted the glycol output to 50%. Apparently, fission fragments split water into hydrogen and hydroxyl radicals—both of which react readily with the hydrogen radicals derived from methanol.

A further increase to 65% yield was obtained by adding trace amounts of chloride-containing compound to the reaction mixture. This increase is attributed to the catalytic effect



CAN COATINGS

helps
make
inks sparkle

Exceptional color retention is characteristic of wet ink overprint varnishes made with *UNITOL ACD* tall oil fatty acids. Ideally suited for can coatings, these varnishes have high resistance to yellowing on both bake–and overbake.

Discover the many advantages of using *UNITOL* tall oil products in your process. Write for information, samples and prices.

unitol
TALL OIL union camp PRODUCTS

Chemical Products Division
UNION BAG-CAMP PAPER
CORPORATION
233 Broadway, New York 7, N. Y.

CHEMICAL WEEK • ADVERTISERS' INDEX

December 19, 1959

AIR REDUCTION CHEMICAL CO. 49
Agency—G. M. Basford Co.

ALLIED CHEMICAL CORP., NATIONAL ANILINE DIV. 47
Agency—James J. McMahon, Inc.

ALLIED CHEMICAL CORP., NITROGEN DIV. 64
Agency—G. M. Basford Co.

AMOCO CHEMICAL CORP. ..... 4th cover
Agency—D'Arcy Advertising Co.

AMERICAN CYANAMID CO. 14-15
Agency—Erwin Wasey-Ruthrauff & Ryan, Inc.

ATLANTIC COAST LINE RAILROAD 48
Agency—Tucker Wayne & Co.

BLOCKSON CHEMICAL CO. 8
Agency—Wm. Balsam Adv.

CELANESE CORP. OF AMERICA 11
Agency—Ellington & Co., Inc.

CHEMICAL CONSTRUCTION CORP. 9
Agency—Godwin Adv. Co.

COLUMBIA SOUTHERN CHEMICAL CORP. 40-41
Agency—Ketchum, MacLeod & Grove, Inc.

COMMERCIAL SOLVENTS CORP. 67
Agency—Fuller & Smith & Ross, Inc.

DAVISON-KENNEDY ASSOC., CO. 46
Agency—Robert E. Martin & Co.

DISTILLATION PROD. INDUSTRIES DIV., EASTMAN KODAK CO. 44
Agency—The Rumrill Co., Inc.

EASTERN STATES PETROLEUM & CHEMICAL CORP. 50
Agency—Erwin Wasey-Ruthrauff & Ryan, Inc.

EASTMAN CHEMICAL PRODUCTS CO. .. 73
Agency—Fred Wittner Co.

EVANS CHEMETICS 28
Agency—Ritter, Sanford, Price & Chalek, Inc.

GEIGY INDUSTRIAL CHEMICALS DIV. OF GEIGY CHEMICAL CORP. 72
Agency—Wilbur-Clanglo, Beckman & Packard Inc.

GENERAL AMERICAN TRANSPORTATION CORP. 42
Agency—Edward H. Weiss & Co.

GLYCERINE PRODUCERS ASSOC. 69
Agency—G. M. Basford Co.

GLYCO CHEMICALS CORP. 76
Agency—G. M. Basford Co.

HARSHAW CHEMICAL CO. 16

HERCULES POWDER CO. 30
Agency—Fuller & Smith & Ross, Inc.

HOOKER CHEMICAL CORP. 53
Agency—The Rumrill Co., Inc.

INTERNATIONAL BUSINESS MACHINES ..... 3rd cover
Agency—Benton & Bowles, Inc.

JEFFERSON CHEMICAL CO. 21
Agency—Robinson-Gerard-McGary, Inc

JOHNS-MANVILLE CORP. 27
Agency—J. Walter Thompson Co.

LUCIDOL DIV. WALLACE & TIERNAN INC. 58
Agency—Barber & Drullard, Inc.

MILES CHEMICAL CO. 36
Agency—Klau-Van Pietersom-Dunlap, Inc.

MOBAY CHEMICAL CO. 63
Agency—Smith, Taylor & Jenkins, Inc.

NORFOLK & WESTERN RAILWAY 12-13
Agency—Houck & Co., Inc.

OLIN MATHIESON CHEMICAL CORP. ... 68
Agency—Doyle, Kitchen & McCormick, Inc.

ONYX OIL & CHEMICAL CO. 32
Agency—Ray Ellis Adv.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. 35
Agency—Downing Industrial Adv., Inc.

PFAUDLER DIV. PFAUDLER PERMUTIT INC. 54-55
Agency—The Rumrill Co., Inc.

SHELL CHEMICAL CORP. ..... 2nd cover
Agency—J. Walter Thompson Co.

SPENCER CHEMICAL CO. 71
Agency—Bruce B. Brewer & Co.

STAUFFER CHEMICAL CO. 31
Agency—John Mather Lupton Co.

STATISTICAL ENGINEERING INSTITUTE 66

STEPAN CHEMICAL CO. 18
Agency—Frank C. Nahser, Inc.

UNION BAG-CAMP PAPER CORP. 17, 77
Agency—Smith, Hagel & Knudsen, Inc.

UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CORP. 45
Agency—J. M. Mathes, Inc.

UNION CARBIDE OLEFINS CO., DIV., UNION CARBIDE CORP. 4-5
Agency—J. M. Mathes, Inc.

VITRO ENGINEERING CO. 59
Agency—Molesworth Assoc.

VOGT MACHINE CO., HENRY 1
Agency—Farson, Huff & Northlich, Adv.

WESTVACO MINERAL PRODUCTS DIV. OF FOOD MACHINERY & CHEMICAL CORP. 2
Agency—James J. McMahon Adv.

WITCO CHEMICAL CO. 6-7
Agency—Hazard Adv. Co.

WYANDOTTE CHEMICALS CORP. 60
Agency—Brooke, Smith French & Dorrance

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

BUSINESS OPPORTUNITY 79

CONTRACT WORK Available/Wanted 79

EMPLOYMENT 79

EQUIPMENT: Used/Surplus New For Sale 79

ADVERTISING STAFF

Atlanta 3 ..... Michael Miller, 1301 Rhodes-Haverty Bldg., JAckson 3-6951

Boston 16 ... Paul F. McPherson, 350 Park Square Building, HUbbard 2-7160

Chicago 11 ..... Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

Cleveland 13 ... H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

Dallas 1 ... Gene Holland, Gordon Jones, The Vaughn Bldg., 1712 Commerce St., Riverside 7-5117

Denver 2 ..... J. Patten, 1740 Broadway, ALpine 5-2981

Detroit 26 ..... H. J. Sweger, Jr., 856 Penobscot Bldg., WOodward 2-1793

Frankfurt/Main ..... Michael R. Zeynel, 85 Westendstrasse, Germany

London E.C. 4 ... E. E. Schirmer, McGraw-Hill House, 95 Farringdon St., England

Los Angeles 17 ... Robert Yocum, 1125 West Sixth St., HUntley 2-5450

New York 36 ..... Knox Armstrong, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

Philadelphia 3 ... William B. Hannum, Jr., 6 Penn Center Plaza, LOcust 8-4330

Pittsburgh 22 ... Duncan C. Stephens, Room 1111 Henry W. Oliver Bldg., EXpress 1-1314

San Francisco 4 ... William C. Woolston, 68 Post St., DOuglas 2-4600

St. Louis 8 ..... R. J. Claussen, 3615 Olive St., Continental Bldg., JEfferson 5-4867

ENGINEERING

of the chlorine on the methylol-forming reacton. The one-step reaction of a hydrogen radical with methanol to yield a hydrogen molecule and methylol radical requires 10 kcal./mole activation energy. But a two-step reaction, using the hydrogen radical to produce a chlorine radical which subsequently reacts with methanol to yield the methylol radical, offers two low-energy paths totaling only 2 kcal./mole.

Though a 65% yield is good enough to assure economic feasibility, it's not necessarily the best that can be attained. "We haven't achieved the optimum yield yet," says Martin. "It could eventually go up to 75-80%."

Process Auxiliaries: In addition to the chemonuclear reactor itself, processing facilities for product recovery will also require a sizable development effort. Because the fission fragments will finally wind up in the product, an efficient method of decontaminating the material is essential.

Recovery operations to extract heat from the product stream will also be required, since there will likely be more than enough waste heat to supply the plant's own power requirements and chemical processing needs. In this respect, AEC's high-temperature chemonuclear process for nitrogen fixation, which operates at about 600 C, would probably be better suited to by-product power generation than would the organic systems, which are limited to about 300 C. (The dust-fueled reactor being evaluated by Armour Research as a commercial power plant operates in the 1500-2000 C range.)

A major difference between chemonuclear reactors and other types contemplated for commercial applications lies in the relatively insignificant role of by-product heat. Estimated annual return from the sale of power from a nitrogen fixation plant, for example, is only $2 million, compared with $5.6 million from the nitrogen products plus $1 million each from sale of argon and nitrogen.

Opportunity for Ingenuity: Though chemonuclear reactors still face a long apprenticeship, Hercules believes they stand a good chance of becoming commercially significant. The fission-fragment processing field, says Martin, should be a good place for the chemical industry to exercise its ingenuity.

Stable Explosions

A new unit operation useful to the chemical process industries may grow out of research described in a paper presented to the American Institute of Chemical Engineers last week in San Francisco. R. A. Gross, senior postdoctorate fellow at the University of California, reported that stable detonation waves had been produced for the first time during experiments carried out in a supersonic research tunnel. The explosive was hydrogen and air.

The waves were described as standing, normal, and oblique. They are expected to provide a new form of energy release that has important applications. Supersonic ramjets using these detonation-waves could be designed with improved length, weight, and fuel consumption.

More important, the controlled explosions provide a new processing technique: it is possible to mix reactive chemical gases at supersonic speeds and control the precise time and position of the reaction by means of a standing detonation wave. At low pressures, the detonation zone would spread out in space, allowing intermediary products to be extracted. Controlled detonation also permits improved design of processing plants where explosions are a hazard. Moreover, the detonation waves may prove a valuable tool in the fundamental study of chemical reaction kinetics.

Smog Cutters

Automobile Manufacturers Assn. says a device to reduce the output of smog-producing components of auto exhaust will be offered on 1961 models made for sale in California.

A cooperative research and development program, says AMA, has revealed that crankcase fumes account for a substantial portion of the total hydrocarbons emitted from an automobile. Previously it was believed that the only source of fumes was spent fuel exhaust. The crankcase fumes come from "blowby," the unburned gasoline vapors forced between the cylinder wall and the piston during the compression stroke; in current models, they are vented to the atmosphere. The new device will feed the fumes back into the engine to be burned in the cylinders.

Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

Published: each Saturday—closes 11 days in advance.

Rate—$3.00 per line ($1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count one half line for box number.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITION VACANT

Wanted Chemist or experienced Technician for interesting small scale organic production project lasting 3 months. New York vicinity. Hummel Chemical Co., 90 West St., New York 6, N.Y. BA 7-6630.

Sohio Chemical Company Wants: Needs: Expects to Hire: For Market Research and Product Development, 3 Men who like small company atmosphere and personal recognition combined with large company resources. 1 Man: Strong organic background for market research related to chemical research activities. Requires knowledge chemical industry, understanding of chemical research, and lots of imagination. Minimum 2 years market research experience preferred. 1 Man: Experienced in market research in fibers and/or thermoplastics. Prefer actual market research experience, but will consider men with adequate technical know-how and an interest in marketing. 1 Man: Experienced in the development and introductory sales of thermoplastic resins. Prefer 5 years development or technical service experience. Position will require man capable of starting with research results and carrying programs through to commercial sales. Please send confidential resume and salary requirements to: R. S. Knight, Manager, Employee Relations, Sohio Chemical Company, P.O. Box 628, Lima, Ohio.

Chemist: A successful plastic extrusion manufacturer in Eastern Massachusetts has opening for a degree chemist to assume responsibility of laboratory on formulation, testing, quality control and new product development. Applicant must have industrial experience in thermoplastics. All replies will be held in strict confidence. P-2943, Chemical Week.

Development Chemist. Young man with several years' experience in metal cleaning operations. Excellent opportunity because of expanding line. Send resume including salary requirements and returnable snapshot, to Director of Research, Brulin & Company, Inc. 2939 Columbia Avenue, Indianapolis 7, Indiana.

POSITION WANTED

Senior Chemical Engineer—16 yrs broad management and technical background. Process engineering, plant operations and R&D. Organics, nuclear chemicals, metals, high energy fuels and propellants. Extensive government contract management experience. AEC and military clearances. PW-3156, Chemical Week.

Chemist, who reached top in present position wishes to relocate with progressive firm: Diversified Analytical, R & D, & Production experience in Chem. Specialty & Aerosol Fields. PW-3279, Chemical Week.

CONTRACT WORK WANTED

Custom Grinding-Ultra Fine or Course-Specialty or Volume Blending and Grinding service on unit or contract basis. Complete CO^2 installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

Small Pigment factory near Chicago wants contract work. CWW-3254, Chemical Week.

BUSINESS OPPORTUNITY

Wanted Organic Chemical Plant. Engaged in the manufacture of dyestuffs and/or intermediates. For purchase, affiliation or other mutually satisfactory arrangement. Old established, multi-plant manufacturer of organic chemicals desires to vertically integrate its operations. Personnel will be retained as far as possible. All replies kept in strict confidence. BO-3203, Chemical Week.

Chemical Investment Opportunity. Chemist (male or female) required who is interested in locating in South Central Texas and able to develop uses and quality control of local organic and inorganic materials. Reply in confidence giving technical background and if able to invest in an interesting, varied, and profitable new industry. BO-3281, Chemical Week.

FOR SALE

$3,000,000 Liquidation-Chemical Plant at Orange, Texas. Type 316 Stainless Steel Tanks, Kettles, Heat Exchangers, Columns, Stills, Crystallizers, Centrifugals, Pumps, Valves, etc. Wonderful Values. Send for list. Perry Equipment Corp., 1415 N. 6th St., Philadelphia 22, Pa.

60" Vulcan T316 SS bubble cap columns or scrubbers, 16' high, 10 trays on 12" spacing. Perry, 1415 N. Sixth St., Philadelphia 22, Pa.

Patterson 6' x 8' Porox Lined Pebble Mill, porcelain pebbles, 50 HP Motor. Perry Equipment Corp., 1415 N. Sixth St., Philadelphia 22, Pa.

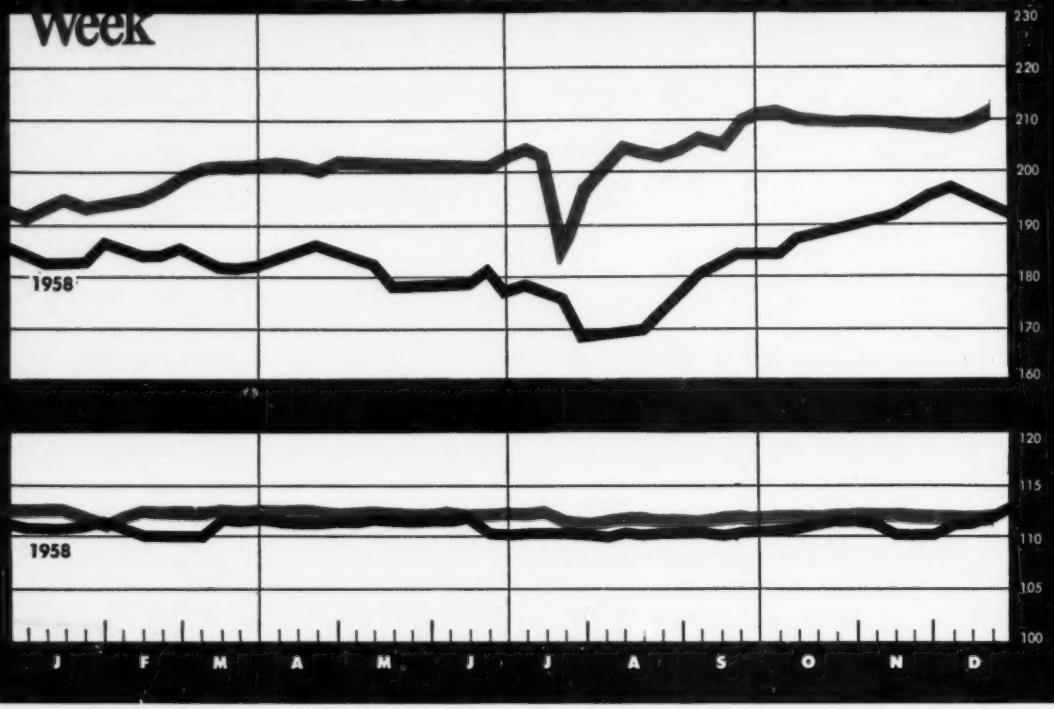
Immediate Delivery—Steel and glass-lined tanks, ideal for food, chemicals, etc. may be inspected and shipped immediately, price 3¢ gal. and up, depending upon the quantity desired: 12-8370-gal. tanks, 10'2" dia. x 15'4"; 3—3100 gal. tanks, 7'1" x 11'8"; 12-7750-gal. tanks, 12' diameter x 11' long; maybe loaded on cars or truck, good for pressure up to 20 psi approx., with manholes in heads, fittings, etc., buy one or several, further details by writing to: Chas. S. Jacobowitz Corp., Dept. CW, 3082 Main St., Buffalo 14, N. Y. Phone AMherst 2100.

Bakelite BR-9432 Resin (Phenol-Formaldehyde) (Orig. Bbls.) $.33/lb. Barium Hydrox. N.F. (J.T. Baker Orig.) 15 Leverpaks $.06/lb. Lacquer Thinner, Off Color $.25/gal. (Bulk). Triethylene Glycol Dicaprylate 10 drums $.18/lb. 30% Phthalic—70% Soya 10 drums $.12/lb. Toluol 10,000 gals. $.20/gal. Aluminum Paste (suitable for roof coating) $.20/lb. Type "S" Anti-Freeze $.39/gal. (in drums). 30,000 lbs. Dibutyl Sebacate, Bulk $.35/lb. 2 orig. drs. Polyethylene Gly. 1000, Monostearate $.20/lb. 3 orig. drs. Barrett Pyridine 15A $.35/lb. O/S 2000 gls mixed Phthalate-Phosphate Plasticizer 20¢ lb. O/S 500 gls TCP Plasticizer 20¢ lb. 3 drs-Isoprene—Enjay virgin 15¢. 2000 lbs. Powdered Paraformaldehyde 9¢ lb. FS-3272, Chemical Week.

OPPORTUNITIES

business; personal or personnel; financial; equipment; etc., may be offered or located through the classified advertising section of CHEMICAL WEEK. For more information, write to: CLASSIFIED ADVERTISING DIVISION P.O. Box 12 New York 36, New York.

BUSINESS BENCHMARKS

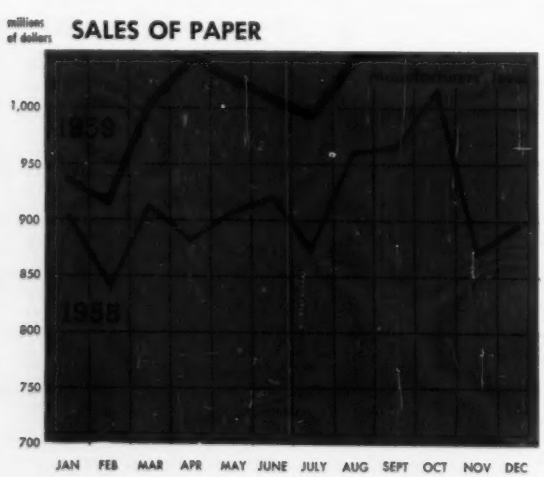


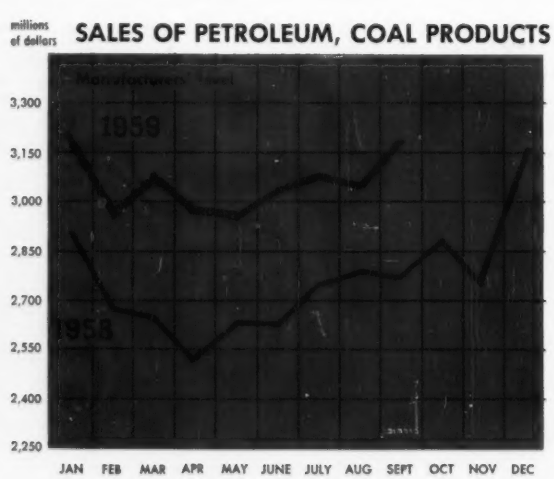
DECEMBER 19, 1959

WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1947-1949=100)	213.0	211.0	193.2
Chemical Week wholesale price index (1947=100)	110.8	110.8	112.0
Stock price index (12 firms, Standard & Poor's)	60.61	59.18	47.70
Steel ingot output (thousand tons)	2,671	2,650	1,985
Electric power (million kilowatt-hours)	13,907	13,173	13,017
Crude oil and condensate (daily av., thousand bbls.)	7,027	6,968	7,067

EMPLOYMENT INDICATORS (thousands)	*Latest Month*	*Preceding Month*	*Year Ago*
All manufacturing	15,993	16,151	15,379
Nondurable goods	6,896	6,929	6,738
Chemicals and allied products	855	857	823
Paper and allied products	565	564	548
Rubber products	272	273	247
Petroleum and coal products	230	230	234

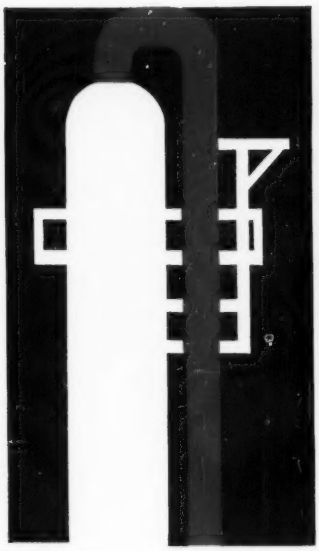
CHEMICAL CUSTOMERS CLOSE-UP





IBM 1620 *data processing system*

...the most powerful engineering computer in its low price class



In the Chemical Industry the IBM 1620 solves problems like these:

- *statistical design of experiments*
- *reactor design*
- *mass spectrometry*
- *kinetics*

The new IBM 1620 is a desk-size engineering computer that offers you more computing ability per dollar than any system in its price class.

Transistorized throughout, the IBM 1620 has a 20,000-digit magnetic core memory with variable field length and immediate accessibility. Its input-output notation, on paper tape and console typewriter, is in convenient decimal arithmetic. It can perform more than 100,000 calculations a minute and is easily adapted to your engineering problems.

Easy to learn, easy to operate, easy to communicate with, the low-cost 1620 helps free your engineering talent for more creative work. And in keeping with our concept of Balanced Data Processing, the IBM 1620 is supported by extensive services. This includes a comprehensive library of mathematical routines and specific industry programs to permit you to put the 1620 to work without unnecessary delay.

Ask your IBM representative about the unique advantages of the IBM 1620. Like all IBM equipment, it may be purchased or leased.

IBM® *balanced data processing*

How to get better anti-skinning and improved drying properties —PANAREZ 6-210 Resin

You can upgrade your alkyd surface coatings to get improvements in both reduced skinning and faster drying through the use of PANAREZ 6-210 Hydrocarbon Resin. You save on inventory of costly anti-skinning agents; you obtain measurable product improvement at low cost. You also get better gloss at lower cost with PANAREZ 6-210 Resin.

To add these product qualities to your alkyd paints, call for assistance from your Amoco sales representative. Experienced alkyd men in Amoco's technical service laboratory will work with you on the use of PANAREZ 6-210 Resin to help you get the properties you want for your finished products. Your inquiry will receive immediate attention.

AMOCO CHEMICALS CORPORATION
910 South Michigan Ave., Chicago 80, Illinois

AMOCO CHEMICALS